

Dirección de Nuevas Creaciones
Superintendencia de Industria y Comercio
E. S. D.

Referencia: Solicitud de Privilegio para Patente de invención
Título: Brazo oscilante para vehículo de dos ruedas
Solicitante: HERO MOTOCORP LIMITED
Exp. No.: NC2021/0003045
Asunto: Respuesta a requerimiento No. 3.471 de 2021

JESÚS M. MÉNDEZ BERMÚDEZ, identificado con cédula de ciudadanía No. 13.491.525 y con Tarjeta Profesional de Abogado No. 99.678 expedida por el Consejo Superior de la Judicatura, actuando como apoderado de la sociedad HERO MOTOCORP LIMITED., por medio del presente escrito me permito dar respuesta al requerimiento de la referencia de la siguiente forma:

1. Análisis de prioridad

Con el objeto de atender a la sugerencia presentada por su Despacho, allego al expediente documento de prioridad debidamente certificado por la autoridad que lo expidió.

2. Poder

Con el objeto de atender a la objeción hecha por su Despacho, allego al expediente documento de poder debidamente diligenciado.

Resueltas la objeciones presentadas, amablemente solicito se continué con el trámite y se autorice la publicación de la solicitud en la gaceta de propiedad industrial.

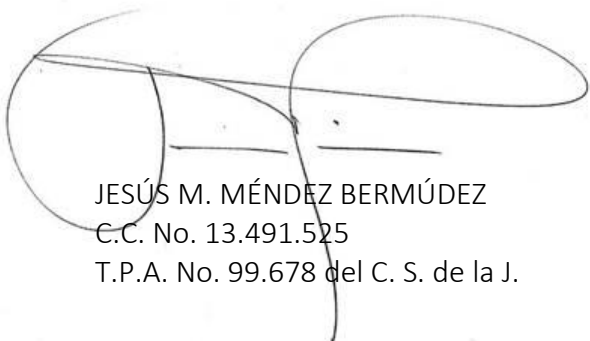
ANEXOS

1. Documento de prioridad.
2. Documento de poder.

NOTIFICACIONES

Recibiré notificaciones en la Secretaría de este Despacho y en mi oficina, ubicada en la Calle 83ª No. 23-90 de esta ciudad.

Cordialmente,



JESÚS M. MÉNDEZ BERMÚDEZ
C.C. No. 13.491.525
T.P.A. No. 99.678 del C. S. de la J.



INTELLECTUAL
PROPERTY INDIA

पेटेंट/डिजाइन/ व्यापार
चिह्न/भौगोलिक उपदर्शन



सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
वाणिज्य एवं उद्योग मंत्रालय
MINISTRY OF COMMERCE & INDUSTRY
पेटेंट कार्यालय
THE PATENT OFFICE

जिस किसी से संबन्धित हो
TO WHOMSOEVER IT MAY CONCERN

मैं, अधोहस्ताक्षरी जो पेटेंट अधिनियम, 1970 की धारा 73(3) के तहत महानियंत्रक एकस्व, अभिकल्प एवं व्यापार चिह्न की ओर से प्रमाणपत्र हस्ताक्षर व जारी करने के लिए प्राधिकृत अधिकारी हूँ, एतद्वारा यह प्रमाणित करता (ती) हूँ कि निम्नलिखित पेटेंट आवेदन के संबंध में फाइल दस्तावेज़(जों) की सही प्रतिलिपि इसके साथ संलग्न है:

I, the undersigned, being an officer duly authorized to sign and issue the certificate on behalf of the Controller General of Patents, Designs and Trademarks in accordance with the provisions of Section 73(3) of the Patents Act, 1970, hereby certify that annexed hereto is a True Copy of the document (s) as filed in connection with the following Patent Application:

क) आवेदन संख्या/ a) Application Number: **202011011046**

ख) फाइल करने की तारीख/ b) Date of Filing: **14th March, 2020**

ग) अनुरोधित दस्तावेज़(जों) का नाम/ c) Name of the document (s) requested:

1) **Application Form-1**

2) **Provisional Specification filed on dated 14th March, 2020 (As per e-filing record) and**

3) **Drawings (As per e-filing record)**

यह प्रमाणपत्र पेटेंट अधिनियम, 1970 की धारा 147(1) के अधीन मुझमें निहित शक्तियों के तहत जारी किया गया है। This certificate is issued under the powers vested in me U/S 147(1) of The Patents Act, 1970.

दिनांक/ Dated this **12th** day of **April, 2021**

(Rishu Bharti)

नियंत्रक पेटेंट व डिजाइन/ Controller of Patents and Designs
(प्राधिकृत हस्ताक्षरी/ Authorised Signatory)

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 APPLICATION FOR GRANT OF PATENT (See section 7, 54 and 135 and sub-rule (1) of rule 20)				(FOR OFFICE USE ONLY)	
		Application No.:			
		Filing date:			
		Amount of Fee paid:			
		CBR No:			
		Signature:			
1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)					
2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]					
Ordinary (✓)		Convention ()		PCT-NP ()	
Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition ()
3A. APPLICANT(S)					
Name in Full		Nationality	Country of Residence	Address of the Applicant	
Hero MotoCorp Limited		Indian	India	House No.	The Grand Plaza,
				Street	Plot No.2, Nelson Mandela Road, Vasant Kunj- Phase -II,
				City	New Delhi
				State	Delhi
				Country	India
				Pin code	110070
3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]					
Natural Person ()		Other than Natural Person			
		Small Entity ()	Startup ()	Others (✓)	

4. INVENTOR(S) [Please tick (✓) at the appropriate category]Are all the inventor(s)
same as the applicant(s)
named above?

Yes ()

No (✓)

If "No", furnish the details of the inventor(s)

Name In Full	Nationality	Country of Residence	Address of the Inventor	
KUMAR, Ashutosh	Indian	India	House No.	M220,B5,Vrinda gardens
			Street	Near Rto Office, Jagatpura
			City	Jaipur
			U.T./State	Rajasthan
			Country	India
			Pin code	302017
Name in Full	Nationality	Country of Residence	Address of the Inventor	
KUMAR, Ashish	Indian	India	House No.	E904, Ashadeep green Avenue
			Street	Opposite Akshaya Patra, Jagatpura
			City	Jaipur
			U.T./State	Rajasthan
			Country	India
			Pin code	302017

5. TITLE OF THE INVENTION: SWING ARM OF VEHICLE**6. AUTHORISED REGISTERED
PATENT AGENT(S)**

IN/PA No.

Name

Mobile No.

**7. ADDRESS FOR SERVICE OF
APPLICANT IN INDIA**

Name

Hero MotoCorp LimitedPostal
Address**Centre of Innovation and Technology,
Plot No.- SPL1, RIICO Industrial Area,
Kukas, Phase 2, NH11C, Jaipur,
Rajasthan-302038**

Telephone No.

**+91 1426 430000
Extn.- 77883**

Mobile No.

+91 9540935323

Fax No.

+91 1426 430001

E-mail ID

patents@heromotocorp.com

8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION		
Country	Application Number	Filing date
Name of the applicant	Title of the invention	IPC (as classified in the convention)
9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)		
International application number	International filing date	
10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION		
Original (first) application No.	Date of filing of original (first) application	
11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT		
Main application/patent No.	Date of filing of main application	
12. DECLARATIONS		
(i) Declaration by the inventor(s) (In case the applicant is an assignee: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period). We, the above named inventor(s) are the true & first inventor(s) for this Invention and declare that the applicant(s) herein are our assignee or legal representative. (a) Date: 11/03/2020 (b) Signature(s): <i>Ashutosh Kumar</i> (c) Name(s): KUMAR, Ashutosh (a) Date: 14/03/2020 (b) Signature(s): <i>Ashish</i> (c) Name(s): KUMAR, Ashish		

(ii) Declaration by the applicant(s) in the convention country

(In case the applicant in India is different than the applicant in the convention country: the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent or send the assignment by post / electronic transmission duly authenticated within the prescribed period)

I/ We, the applicant(s) in the convention country declare that the applicant(s) herein is / are my / our assignee or legal representative.

(a) Date

(b) Signature(s)

(c) Name(s) of the signatory

(iii) Declaration by the applicant(s)

We the applicant(s) hereby declare(s) that: -

- ☒ (✓) We are in possession of the above-mentioned invention.
- ☒ (✓) The provisional specification relating to the invention is filed with this application.
- ☐ The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.
- ☒ (✓) There is no lawful ground of objection(s) to the grant of the Patent to me/us.
- ☐ I am/we are the true & first inventor(s).
- ☒ (✓) We are the assignee or legal representative of true & first inventor(s).
- ☐ The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of my/our invention(s).
- ☐ I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.
- ☐ My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.
- ☐ The application is divided out of my /our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on _____ under section 16 of the Act.
- ☐ The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

(a) Form 2

Item	Details		Fee	Remarks
Provisional specification	No. of pages	12	8000	Excluding Drawings
No. of Claim(s)	No. of claims and No. of pages			No claims are being filed at this stage.
Abstract	No. of pages			
No. of Drawing(s)	No. of drawings and No. of pages	7 and 7		

(b) Statement and Undertaking on Form 3; .

(c) Declaration of Inventorship on Form 5;

Total fee **Rs.8000/-** in Cash/**Net Banking/** Bank Draft No _____ Date
_____ on _____ Bank.

I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters slated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this 12th day of March, 2020

Signature:



Sagar Sudhir Dhatrak

Assistant General Manager & Section Head-COC(EDD)

Hero MotoCorp Limited

To,
The Controller of Patents
The Patent Office,
at New Delhi

FORM 2

THE PATENT ACT, 1970
(39 of 1970)

&

THE PATENT RULES, 2003

PROVISIONAL SPECIFICATION

(See Section 10, Rule 13)

SWING ARM OF VEHICLE

APPLICANT:

HERO MOTOCORP LIMITED, an Indian Company at: The Grand Plaza, Plot No.2,
Nelson Mandela Road, Vasant Kunj- Phase -II, New Delhi, India, 110 070

The following specification describes the invention.

FIELD OF INVENTION

[0001] The present invention relates to two wheeled vehicles and, more particularly, to a swing arm of a two wheeled vehicle.

BACKGROUND

5 [0002] A vehicle, particularly vehicle configured to be ridden such as motorized scooter, motorcycle, three-wheeled vehicle, and four wheeled vehicle such as all-terrain vehicles, include an internal combustion engine and a body frame of the vehicle. The power generated by the internal combustion engine is transferred to
10 wheels and other auxiliary components of the vehicle. The internal combustion engine is carried by the frame of the vehicle.

[0003] Typically, the frame includes a swing arm that rotatably supports a rear wheel. Further, the swing arm acts as a support member to one or more rear suspensions and other vehicle components. The swing arm is generally formed by left
15 and right arms to which a wheel axle of the rear wheel is attached to a rear side, and front side of the swing arm is hingably supported to a vehicle body frame. A cross member is coupled to the left and right arms of the swing arm. The cross member is provided with a bracket member extending upwards from the cross member, the bracket member supports a lower portion of the rear suspension of the vehicle.

20 [0004] In certain vehicles, for example in off-road vehicle, the swing arm, in addition to performing aforementioned functions, also acts as an aesthetics imparting component. Therefore, in such vehicle, it is desired that the swing arm has aesthetic features. At the same time, in such vehicle, owing to higher amount of loads acting on the swing arm, it becomes essential that the swing arm is manufactured of a strong
25 material. Conventional swing arms often fail have as much strong as desired, particularly in off road applications. Moreover, it remains difficult to provide required

aesthetic features on the swing arm, if the swing arm is made from high strength material, using conventional manufacturing methods.

BRIEF DESCRIPTION OF DRAWINGS

5 [0005] The invention itself, together with further features and attended advantages, will become apparent from consideration of the following detailed description, taken in conjunction with the accompanying drawings. One or more embodiments of the present invention are now described, by way of example only wherein like reference numerals represent like elements and in which:

10 [0006] Figure 1 illustrates a side view of an exemplary two wheeled vehicle, according to an embodiment of the present invention;

 [0007] Figure 2 illustrates a side view of a frame of the exemplary two wheeled vehicle, according to an embodiment of the present invention;

15 [0008] Figure 3 illustrates a bottom view of a swing arm of the exemplary two wheeled vehicle of Figure. 1, according to an embodiment of the present invention;

 [0009] Figure 4 illustrates another bottom view of the swing arm of the exemplary two wheeled vehicle of Figure. 1, according to an embodiment of the present invention;

20 [00010] Figure 5 illustrates side view of the swing arm of the exemplary two wheeled vehicle of Figure. 1, according to an embodiment of the present invention;

 [00011] Figure 6 illustrates a perspective view of the swing arm of the exemplary two wheeled vehicle of Figure. 1, according to an embodiment of the present invention; and

25 [00012] Figure 7 illustrates a side view of the swing arm of the exemplary two wheeled vehicle of Figure. 1, according to an embodiment of the present invention;

[00013] The drawings referred to in this description are not to be understood as being drawn to scale except if specifically noted, and such drawings are only exemplary in nature.

5

DETAILED DESCRIPTION

[00014] While the invention is susceptible to various modifications and alternative forms, an embodiment thereof has been shown by way of example in the drawings and will be described here below. It should be understood, however that it is not intended to limit the invention to the particular forms disclosed, but on the contrary, the invention is to cover all modifications, equivalents, and alternative falling within the spirit and the scope of the invention.

[00015] The term "comprises", comprising, or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a setup, structure or method that comprises a list of components or steps does not include only those components or steps but may include other components or steps not expressly listed or inherent to such setup or structure or method. In other words, one or more elements in a system or apparatus preceded by "comprises... a" does not, without more constraints, preclude the existence of other elements or additional elements in the system or apparatus.

[00016] For better understanding of this invention, reference would now be made to the embodiment illustrated in the accompanying Figures and description here below, further, in the following Figures, the same reference numerals are used to identify the same components in various views.

[00017] In an embodiment of the present invention provides a swing arm of a vehicle having a frame. The swing arm comprises a first arm having an front end portion, a rear end portion, and an intermediate portion connecting the front end portion and the rear end portion; a first wheel support portion defined on the rear end

portion of the first arm; a second arm having an front end portion, a rear end portion, and an intermediate portion connecting the front end portion and the rear end portion; a second wheel support portion defined on the rear end portion of the second arm; a bridge member connected to intermediate portion of the first arm with the intermediate portion of the second arm; and a pivot pipe connected to the front end portion of the first arm and the front end portion of the second arm. Each of the first arm, the second arm, the first wheel support portion and the second wheel support portion are composed from a hydroforming process.

[00018] Further, each of the first arm, the second arm, the first wheel support portion and the second wheel support portion are composed of a high strength material. In an example the high strength material may be a steel alloy.

[00019] Each of the first arm and the second arm include aesthetic impressions thereon, imparted during the hydroforming process. The front end portion of the first arm has a first cross sectional area, the rear end portion of the first arm has a second cross sectional area, and the intermediate portion of the first arm has a third cross sectional area. The third cross sectional area of the first arm is bigger than or greater than each of the first cross sectional area of the first arm, and the second cross sectional area of the first arm.

[00020] The front end portion of the second arm has a first cross sectional area, the rear end portion of the second arm has a second cross sectional area, and the intermediate portion of the second arm has a third cross sectional area. The third cross sectional area of the second arm is bigger than each of the first cross sectional area of the second arm, and the second cross sectional area of the second arm.

[00021] The third cross sectional area of the first arm is bigger than the third cross sectional area of the second arm.

[00022] The present invention also provides a swing arm of a vehicle having a frame. The swing arm comprises a first arm having an front end portion, a rear end portion, and an intermediate portion connecting the front end portion and the rear end

portion, wherein the front end portion of the first arm has a first cross sectional area, the rear end portion of the first arm has a second cross sectional area, and the intermediate portion of the first arm has a third cross sectional area, wherein, the third cross sectional area of the first arm is bigger than each of the first cross sectional area of the first arm, and the second cross sectional area of the first arm; a first wheel support portion defined on the rear end portion of the first arm; a second arm having an front end portion, a rear end portion, and an intermediate portion connecting the front end portion and the rear end portion, wherein the front end portion of the second arm has a first cross sectional area, the rear end portion of the second arm has a second cross sectional area, and the intermediate portion of the second arm has a third cross sectional area; a second wheel support portion defined on the rear end portion of the second arm; a bridge member connected to intermediate portion of the first arm with the intermediate portion of the second arm; and a pivot pipe connected to the front end portion of the first arm and the front end portion of the second arm.

[00023] The first arm, the second arm, the first wheel support portion and the second wheel support portion are composed from a hydroforming process. The third cross sectional area of the second arm is bigger than each of the first cross sectional area of the second arm, and the second cross sectional area of the second arm, and wherein each of the first arm and the second arm are composed of a high strength material, each of the first arm and the second arm include esthetic impressions thereon, imparted during the hydroforming process. The third cross sectional area of the first arm is bigger than the third cross sectional area of the second arm.

[00024] While the present invention is illustrated in the context of a vehicle, however, swing arm and aspects and features thereof can be used with other type of vehicles as well. The terms "vehicle", "two wheeled vehicle" and "motorcycle" have been interchangeably used throughout the description. The term "vehicle" comprises vehicles such as motorcycles, scooters, bicycles, mopeds, scooter type vehicle, all-terrain vehicles (ATV) and the like.

[00025] The terms "front / forward", "rear / rearward / back / backward", "up / upper / top", "down / lower / lower ward / downward, bottom", "left / leftward", "right / rightward" used therein represents the directions as seen from a vehicle driver sitting astride and these directions are referred by arrows Fr, Rr, U, Lr, L, R in the drawing Figures.

[00026] Referring to Figures 1, a vehicle (10) according to an embodiment of the present invention is illustrated. The vehicle (10) referred to herein, embodies a two wheeled motorcycle. Alternatively, the vehicle (10) may embody any other ridden vehicles such as scooters, three-wheeled vehicles, All-Terrain Vehicles (ATV) etc. without limiting the scope of the invention.

[00027] The vehicle (10) comprises one or more body parts, such as a frame (12), a handle bar (14), a front wheel (16), a rear wheel (18), an engine (200), a headlight (22), and a fuel tank (24). The frame (12) supports the engine (200) in middle portion of the vehicle (10). In the illustrated example, the engine (200) provides necessary power required to drive the rear wheel (18) of the vehicle (10). Alternatively, the engine (200) may provide necessary power to the drive the front wheel (16), or both the front wheel (16) and the rear wheel (18) simultaneously, without limiting the scope of the invention. The rear wheel (18) is linked to the engine (200) through a transmission mechanism (not numbered). The fuel tank (24) provides necessary fuel to the engine (200) to generate power within the vehicle (10).

[00028] Referring to Figure 2, the vehicle (10) comprises the frame (12). The frame (12) is formed by integrally joining number of steel members and the like, by welding or the like. In the illustrated example, the frame (12) having a specific construction is disclosed. Alternatively, the frame (12) may have different body frame constructions generally associated with motorcycles, without limiting the scope of the invention.

[00029] The frame (12) comprises a head tube (124), a lower frame member (125) and an upper frame member (126). The upper frame member (126) extends downward

and rearward in the longitudinal direction of the vehicle (10) from the head tube (124). A pivot plate (129) is disposed on rear portion of the upper frame member (126). The upper frame member (126) supports the fuel tank (114). The lower frame member (125) extends downward and rearward in the longitudinal direction of the vehicle (10) from the head tube (124), and is disposed below the upper frame member (126). The lower frame member (125) supports the power unit (110) (shown in Figure 1). The head tube (124) is a cylindrical member which supports the steering assembly (104) and the front ground engaging member (16). The steering shaft (not shown) is rotatably supported on the head tube (124). The front fork (117) is inclined at an inclination angle substantially similar to that of the head tube (124).

[00030] The frame (12) comprises a left seat rail member (123) and a right seat rail member (127). The left seat rail member (123) and the right seat rail member (127) extend rearwards from the upper frame member (126). The left seat rail member (123) and the right seat rail member (127) support the seat (116) of the vehicle (10). The lower frame member (125) and the pivot plate (129) provided on the rear portion of the upper frame member (126) support the engine (112) of the vehicle (10).

[00031] The frame (12) comprises a left sub frame member (131) and a right sub frame member (133). The left sub frame member (131) extends between the left seat rail member (123) and the pivot plate (129). The right sub frame member (133) extends between the right seat rail member (127) and the pivot plate (129). The left sub frame member (131) and the right sub frame member (133) provides support for the left seat rail member (123) and the right seat rail member (127) respectively.

[00032] As shown in Figure. 3, Figure 4, and Figure. 5, the vehicle (10) comprises a swing arm (220). The swing arm (220) is operatively coupled to the frame (12). The swing arm (220) rotatably supports the rear ground engaging member (18). The swing arm (220) comprises a left arm (300) and a right arm (400). The left arm (300) is also referred to as a first arm (300), and the right arm (400) may be also referred to as a second arm (400). In an alternative embodiment, the left arm (300) may be referred to as a second arm, and the right arm (400) may be referred to as a first arm.

[00033] The first arm (300) includes a front end portion (302), a rear end portion (304), and an intermediate portion (306) connecting the front end portion (302) and the rear end portion (304). A first wheel support portion (350) is defined on the rear end portion (304) of the first arm (300). In an embodiment, the first wheel support portion (350) defined on the rear end portion (304) of the first arm (300), is integral to the first arm (300).

[00034] As such, the first arm (300) i.e., each of the front end portion (302), the rear end portion (304), the intermediate portion (306) and the first wheel support portion (350) are formed using hydroforming process. In an example, each of the front end portion (302), the rear end portion (304), the intermediate portion (306) and the first wheel support portion (350) are formed using hydroforming process from a single pipe. Therefore, the front end portion (302), the rear end portion (304), the intermediate portion (306) and the first wheel support portion (350), are a single component having same wall thickness, as that of the pipe from which they are formed.

[00035] In an embodiment, the first arm (300) i.e., each of the front end portion (302), the rear end portion (304), the intermediate portion (306) and the first wheel support portion (350) are formed of a high strength material. In an example, each of the front end portion (302), the rear end portion (304), the intermediate portion (306) and the first wheel support portion (350) are formed of a high strength steel alloy.

[00036] The first arm (300) includes a set of aesthetic impressions (308) formed thereon. In particular, the set of aesthetic impressions (308) are formed on the intermediate portion (306) of the first arm (300). Moreover, the set of aesthetic impressions (308) are formed on the intermediate portion (306) of the first arm (300) using hydroforming process, i.e., imparted during the hydroforming process.

[00037] As shown in Figure 6 and Figure 7, the front end portion (302) of the first arm (300) has a first cross sectional area F1, the rear end portion (304) of the first arm (300) has a second cross sectional area F2, and the intermediate portion (306) of the

first arm (300) has a third cross sectional area F3. The third cross sectional area F3 of the first arm (300) is bigger than each of the first cross sectional area F1 of the first arm (300), and the second cross sectional area F2 of the first arm (300).

5 [00038] Owing to the bigger and larger cross section of the third cross sectional area F3 of the first arm (300) compared to the each of the first cross sectional area F1 of the first arm (300), and the second cross sectional area F2 of the first arm (300), the intermediate portion (306) of the first arm (300) has a higher strength, and is stronger.

10 [00039] The second arm (400) includes a front end portion (402), a rear end portion (404), and an intermediate portion (406) connecting the front end portion (402) and the rear end portion (404). As shown in Figure 6, a second wheel support portion (450) is defined on the rear end portion (404) of the second arm (400). In an embodiment, the second wheel support portion (450) defined on the rear end portion (404) of the second arm (400), is integral to the second arm (400).

15 [0001] As such, the second arm (400) i.e., each of the front end portion (402), the rear end portion (404), the intermediate portion (406) and the second wheel support portion (450) are formed using hydroforming process. In an example, each of the front end portion (402), the rear end portion (404), the intermediate portion (406) and the second wheel support portion (450) are formed using hydroforming process from a single pipe. Therefore, the front end portion (402), the rear end portion (404), the intermediate portion (406) and the second wheel support portion (450), are a single component having same wall thickness.

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[0002] In an embodiment, the second arm (400) i.e., each of the front end portion (402), the rear end portion (404), the intermediate portion (406) and the second wheel support portion (450) are formed of a high strength material. In an example, each of the front end portion (402), the rear end portion (404), the intermediate portion (406) and the second wheel support portion (450) are formed of a high strength steel alloy.

25

[0003] The second arm (400) includes a set of aesthetic impressions (not illustrated) formed thereon. In particular, the set of aesthetic impressions are formed

on the intermediate portion (406) of the second arm (400). Moreover, the set of aesthetic impressions are formed on the intermediate portion (406) of the second arm (400) using hydroforming process, i.e., imparted during the hydroforming process.

5 [0004] As shown in Figure 6 and Figure 7, the front end portion (402) of the second arm (400) has a first cross sectional area S1, the rear end portion (404) of the second arm (400) has a second cross sectional area S2, and the intermediate portion (406) of the second arm (400) has a third cross sectional area S3. The third cross sectional area S3 of the second arm (400) is bigger than each of the first cross sectional area S1 of the second arm (400), and the second cross sectional area S2 of the second arm (400).

10 [00040] Owing to the bigger and larger cross section of the third cross sectional area S3 of the second arm (400) compared to the each of the first cross sectional area S1 of the second arm (400), and the second cross sectional area S2 of the second arm (400), the intermediate portion (406) of the second arm (400) has a higher strength, and is stronger.

15 [00041] In an embodiment, the third cross sectional area F3 of the first arm (300) is bigger than the third cross sectional area S3 of the second arm (400).

20 [0005] Referring now to Figure 3, and Figure 4, the swing arm (220) comprises a bridge member (140). The bridge member (140) is a hollow member provided between the left arm (300) and the right arm (400) connecting the two arms together in a side-by-side relation to each other the swing arm (220). In particular, the bridge member (140) connects the intermediate portion (306) of the first arm (300) with the intermediate portion (406) of the second arm (400). In an example, the bridge member (140) is welded to the intermediate portion (306) of the first arm (300) and the intermediate portion (406) of the second arm (400).

25 [0006] The swing arm (220) further comprises a pivot pipe (142) connected to the front end portion (302) of the first arm (300) and the front end portion (402) of the second arm (400). In an example, the pivot pipe (142) is welded to the front end

portion (302) of the first arm (300) and the front end portion (402) of the second arm (400).

[0007] While few embodiments of the present invention have been described above, it is to be understood that the invention is not limited to the above embodiments and modifications may be appropriately made thereto within the spirit and scope of the invention.

[0008] While considerable emphasis has been placed herein on the particular features of this invention, it will be appreciated that various modifications can be made, and that many changes can be made in the preferred embodiments without departing from the principles of the invention. These and other modifications in the nature of the invention or the preferred embodiments will be apparent to those skilled in the art from the disclosure herein, whereby it is to be distinctly understood that the foregoing descriptive matter is to be interpreted merely as illustrative of the invention and not as a limitation.

Dated this 12th day of March, 2020

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Sagar Sudhir Dhatrak
Assistant General Manager & Section Head- COC(EDD)
Hero MotoCorp Limited

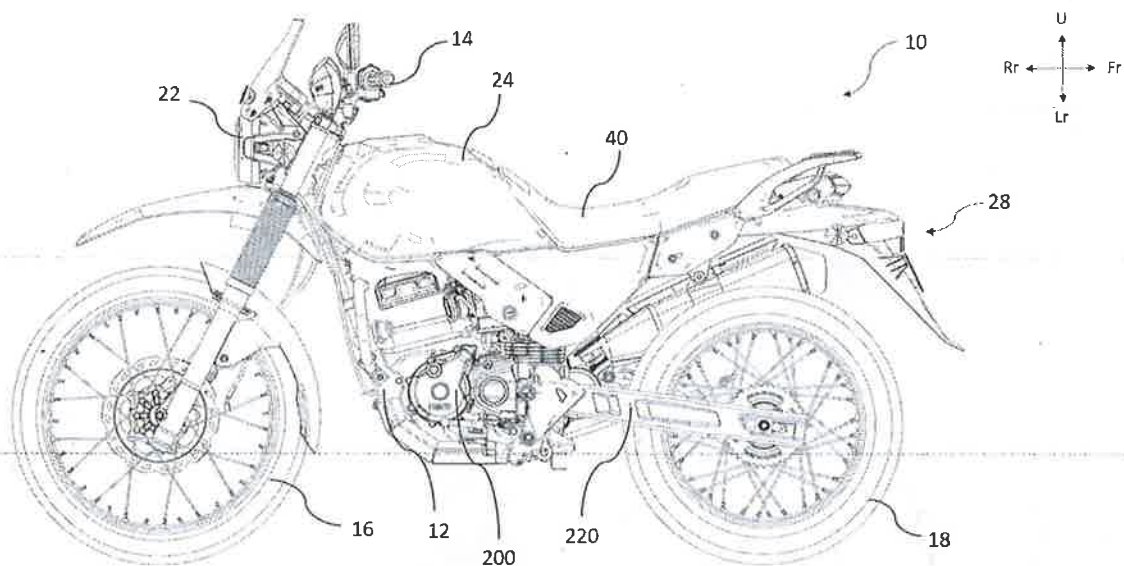


Figure 1

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Assistant General Manager & Section Head- COC(EDD)
Hero MotoCorp Limited

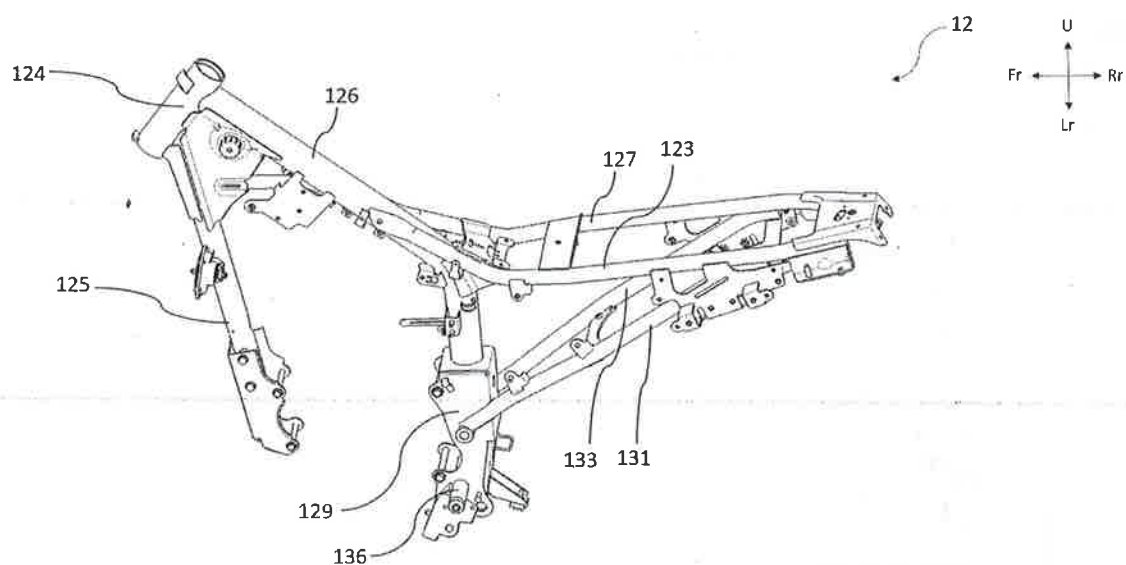
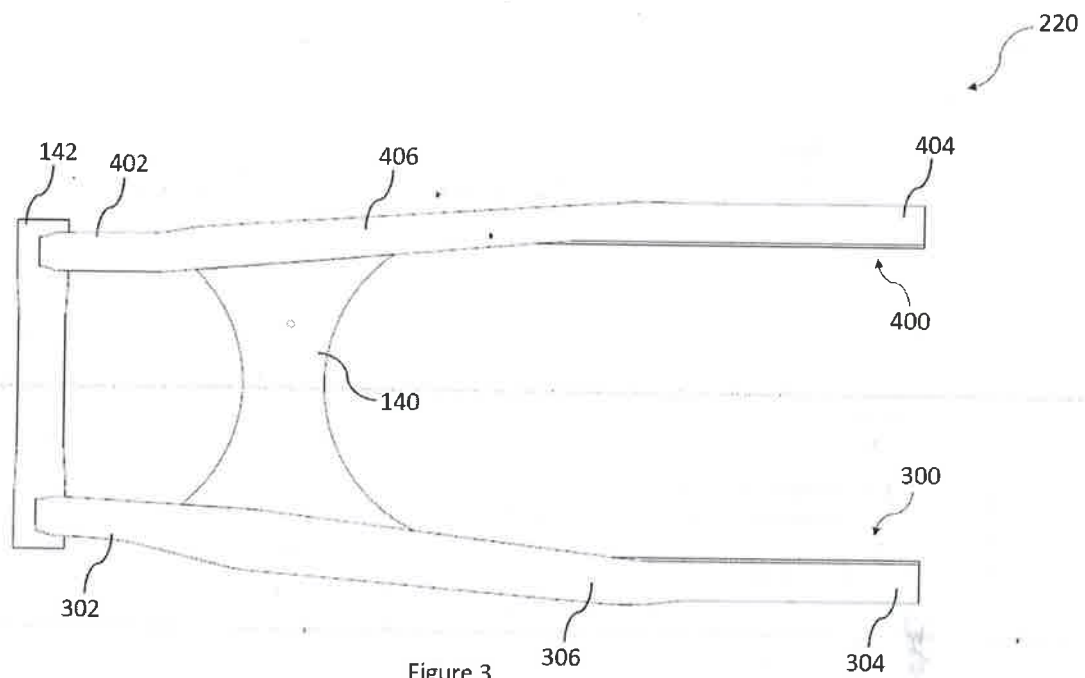


Figure 2

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Sagar Sudhir Dhattrak
Assistant General Manager & Section Head- COC(EDD)
Hero MotoCorp Limited



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Sagar Sudhir Dhatrak
Assistant General Manager & Section Head- COC(EDD)
Hero MotoCorp Limited

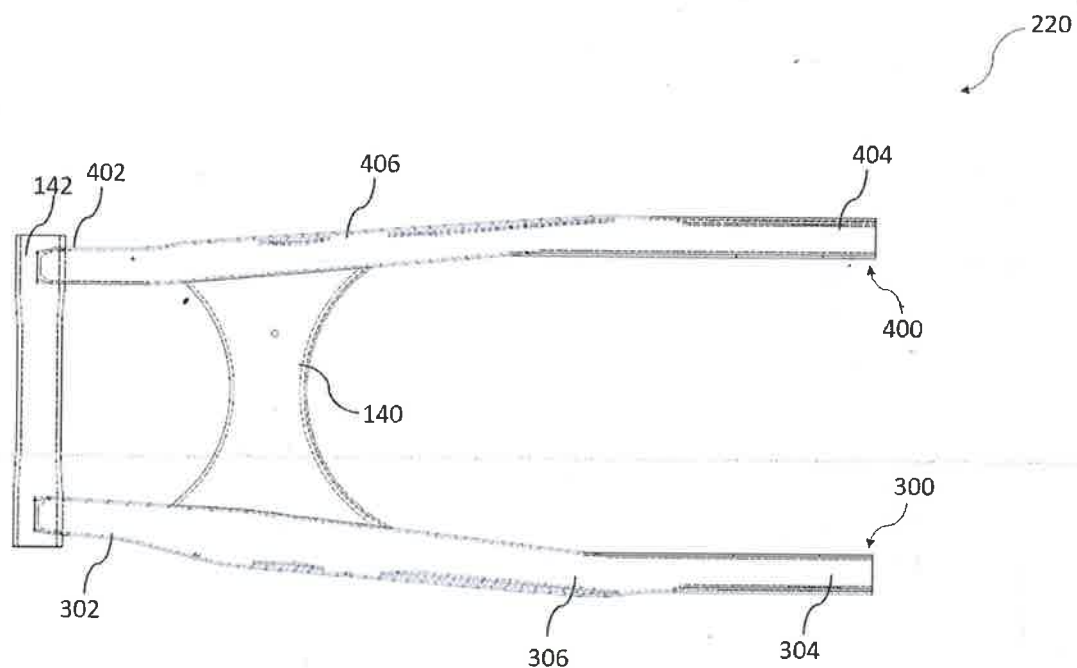


Figure 4

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Assistant General Manager & Section Head- COC(EDD)
Hero MotoCorp Limited

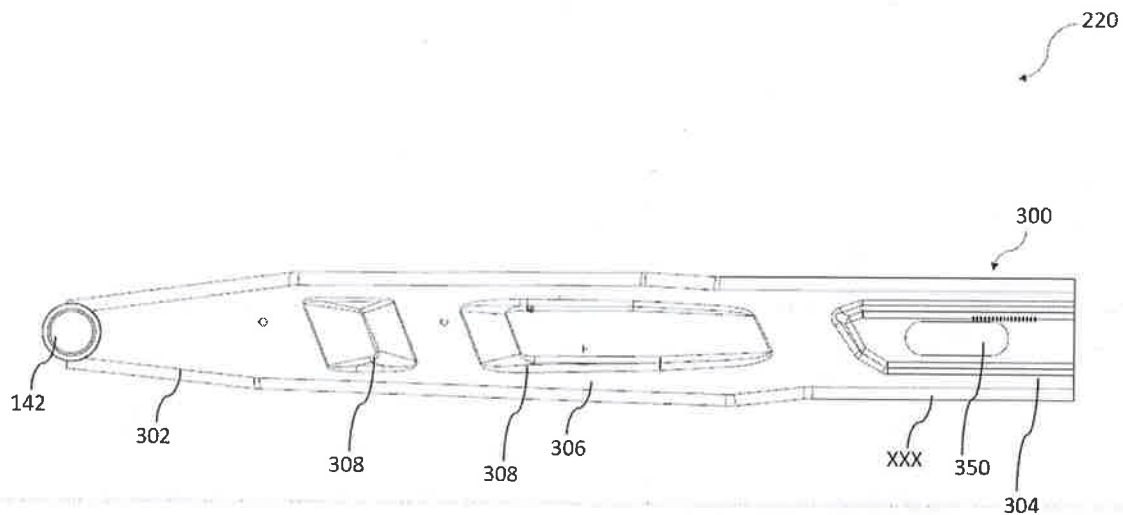


Figure 5

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Assistant General Manager & Section Head- COC(EDD)
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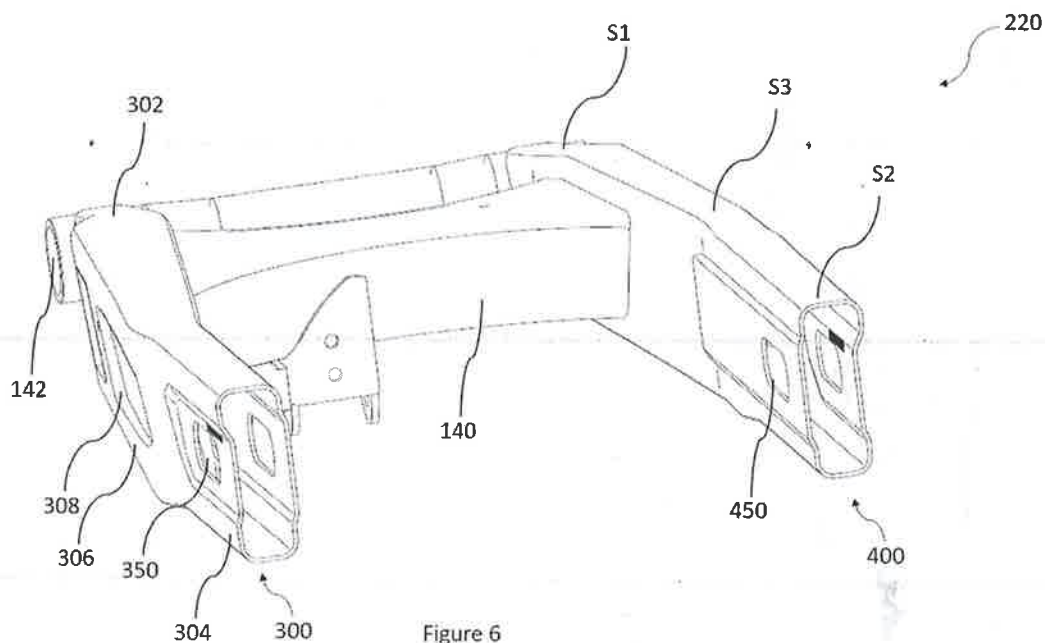
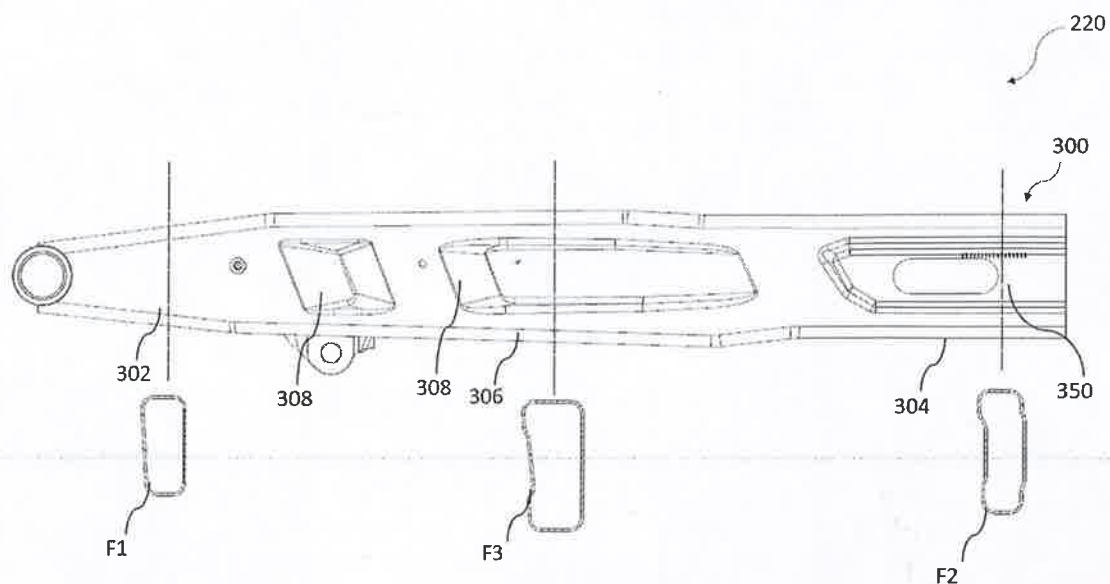


Figure 6

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Sagar Sudhir Dhatriak
Assistant General Manager & Section Head- COC(EDD)
Hero MotoCorp Limited



---Digitally Signed---
Sagar Sudhir Dhatriak
Assistant General Manager & Section Head- COC(EDD)
Hero MotoCorp Limited

FOR INTELLECTUAL PROPERTY

Yo, _____ actuando en nombre y representación de **HERO MOTOCORP LIMITED** con domicilio en **The Grand Plaza, Plot No.2, Nelson Mandela Road, Vasant Kunj- Phase -II, New Delhi, India, 110 070**, por el presente nombra a la Dra. Mónica Wolf Wasserman, identificada con C. C. No. 51.711.267 y/o al Dr. Jesús M. Méndez Bermúdez, identificado con C. C. No. 13.491.525, miembros de la firma **WOLF • MENDEZ • ABOGADOS ASOCIADOS**, con domicilio en la Diagonal 83A No. 23 - 90, de Bogotá D.C. - Colombia, como sus representantes legales, para que actúen conjunta o separadamente al propósito de recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. En desarrollo de dicha calidad los representantes, o los apoderados que ellos designen, podrán recabar de las autoridades administrativas, trámites de solicitudes de patente, en especial de la patente prioridad de India No. 202011011046 en Colombia a cuyo efecto les faculta para dar ante dichas autoridades todos los pasos necesarios al objeto indicado y en fin tomar todas las medidas que creyeran conducentes al resguardo de nuestros intereses con todas las demás facultades legales necesarias. Este poder comprende además las facultades de recibir, desistir, transigir, conciliar, comprometer, sustituir en todo o en parte, revocar sustituciones y ratificar actuaciones anteriores hechas en calidad de Agentes Oficiosos.

Dado y firmado en India, el día 2 de marzo de 2021.

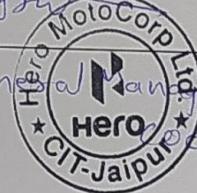
(Firma)

The undersigned, _____ acting on behalf of **HERO MOTOCORP LIMITED** with domicile in **The Grand Plaza, Plot No.2, Nelson Mandela Road, Vasant Kunj- Phase -II, New Delhi, India, 110 070**, hereby appoints Dr. Mónica Wolf Wasserman, identified with Citizenship Card No. 51.711.267 and/or Dr. Jesús M. Méndez Bermúdez, identified with Citizenship Card No. 13.491.525, attorneys at law of the firm **WOLF • MENDEZ • ABOGADOS ASOCIADOS** domiciled in Diagonal 83A No. 23 - 90, of Bogotá - Colombia, as our legal representatives, so that either or both said attorneys may act for the purpose of receiving notifications and to appoint attorneys to act in and out of court. In such capacity the representatives, or the attorneys by them appointed, may request from the administrative authorities filing patent applications in particular a Indian patent priority application No. 202011011046 in Colombia for which they are empowered to take before said authorities all the necessary steps for the purposes indicated, and to take any other measures that may be deemed conducive to the safeguard of our interests, with all necessary legal faculties to receive, withdrawal, compromise, transact, conciliate, substitute in all or in part, to revoke substitutions and ratify acts done as attorney de facto.

Given and signed in India on March 2, 2021.

(Signature)

[Handwritten Signature]



Asst. General Manager & Section Head (E&DD)

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TO BE AFFIXED