



New connection on: : 29-08-2017 : 21:35:23 - Last disconnection on: : 29-08-2017 : 20:11:01

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[EPODOC: SS 13] film and thermoplastic

Results in EPODOC **43.703**

[SS 14] 13 and channel and thickness

Results in EPODOC **32**

[SS 15] 14 and polyethylene

Results in EPODOC **6**

[SS 16] ..li



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PN - [JPH0295824](#) A 19900406

PNFP - JP2564178B B2 19961218

PR - JP19880249654 19881003

AP - JP19880249654 19881003

DT - I

FI - B29C53/24; B29C53/26; B29C59/04&C; B29L31/14; B29L7/00

FT - 4F209/AA10; 4F209/AA11; 4F209/AG01; 4F209/AG04; 4F209/AG21; 4F209/NA08; 4F209/NB02; 4F209/NK10

PA - (A)
NISSEN KAGAKU KOGYO KK

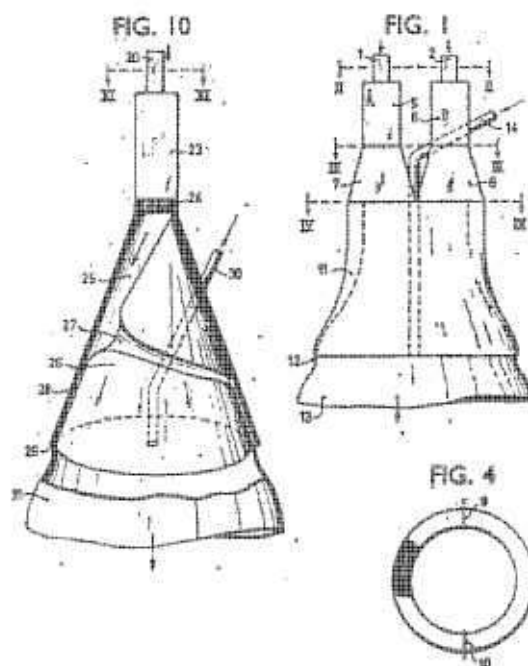
TI - (A)
CORRUGATE SYNTHETIC RESIN **FILM** OR SHEET WITH AIR PERMEABLE HOLE AND MANUFACTURE THEREOF

AB - (A)
PURPOSE:To obtain a corrugated sheet material, which is fully flexible in the repeating direction of corrugations and favorably air-permeable, by a structure wherein each corrugation is cut in pieces by channels, which run normal to the corrugation, and an opening is provided at the side face of the cut corrugation. CONSTITUTION:The corrugated plastic **film** or sheet concerned is substantially made in the form of a

corrugated sheet or **film** having the **thickness** of from several millimeters to several ten micromillimeters out of all the **film**-making **thermoplastic** resin such as **polyethylene**, polypropylene or the like by injection molding or other means. Stock resin may well contain additives such as plasticizer and the like, when necessary. As essential constitution, channels, which run so as to meet corrugations, are equipped. The channels run as a rule from the end of the sheet to the end so as to pass through the sheet. However, as the case may be, the channels can arbitrary be cut halfway. In the extreme case, the corrugations and the channels are cut each other by the half pitch of the corrugations, resulting in showing the rhombiform external appearance. A through hole is formed at the edge face of each corrugation cut by each **channel** or at one side face or both side faces, which are parallel to the **channel**, of the corrugation. The corrugations 2, 2... constituting a **thermoplastic** sheet 1A produce a large number of independent roof-like parts 2a, 2a..., each of which is cut in a piece by the channels 3, 3... traversing perpendicular to the corrugation. At the same time, through holes 4, 4... are bored at the edge face on this side of the figure of the respective independent roof-like parts. In this case, the depth of the bottom part (the through part) 2b of the corrugation (the distance from the crest of the wave to the bottom of the wave) is equal to the depth of the **channel** 3.

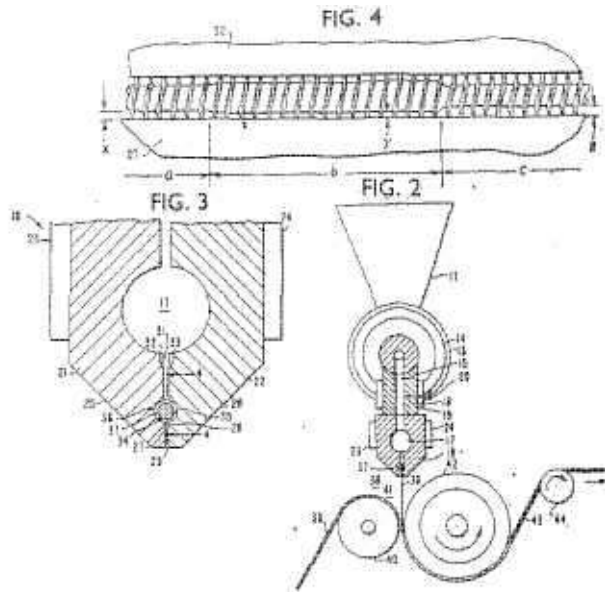
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- PN - [GB1252174](#) A 19711103
- PR - NL19680003692 19680315
- AP - GBD1252174 19690314
- DT - **
- CCI - [B29C47/0014](#) ; [B29C47/0023](#) ;
[B29C47/003](#) ; [B29C47/009](#) ;
[B29C47/065](#) ; [B29C47/26](#) ;
[F16L9/12](#)
- CCA - [B29C47/0026](#) ; [B29C2791/007](#)
- AB - 1,252,174. Extrusion of multi-layered products. ALGEMENE KUNSTZIJDE UNIE N.V. 14 March, 1969 [15 March, 1968], No. 13458/69. Headings B5A and B5B. In the production of multi-layered polymeric tubes, which may be of **film thickness**, or rods, a stream comprising at least two contiguous layers of different polymers is doubled at least once and simultaneously flattened as described in Specification 883,989 (see Division B1) with the thinnest layer having a **thickness** of not less than 1 mm., and the resultant stream is extruded. As



shown in Fig. 1, streams 1 and 2 each comprising two different polymers are doubled and flattened in sections 5, 6 respectively, and the streams are each converted from a square section comprising eight layers, Fig. 3 (not reproduced), to semi-annular streams in sections 7, 8. Such streams unite at the downstream ends of sections 7, 8 to form a single annular stream, Fig. 4, which flows through converging extrusion passageway 11 to extrusion orifice 12. The extrudate which emerges with a total **thickness** of, e.g. 1 mm., is blown to form a tubular **film**. In the embodiment of Figs. 5 and 6 (not shown), a relatively thick walled tube is formed. In the embodiment of Figs. 7-9, a rod of circular or I-section may be produced. The tubular **film**-forming embodiment of Fig. 10 comprises a conical member 26 having a surface **channel** 27. Multi-layer stream 24 is divided by the **channel** to form an annular stream within passageway 28. Polymers mentioned are **polyethylene**, polyamide, polyester and **thermoplastic** rubber.

PN - [GB1231144](#) A 19710512
 PR - US19680700968 19680126
 AP - GBD1231144 19690116
 DT - **
 CCI - [B29C47/14](#) ; [B32B27/00](#)
 CCA - [B29C47/0021](#)
 AB - 1,231,144. Die for extruding films having zones differing in **thickness**; laminates. INTERNATIONAL PAPER CO. 16 Jan., 1969 [26 Jan., 1968], No. 2633/69. Headings B5B and B5N. As shown in Fig. 3, a die for melt extruding a **film** of **thermoplastic** material having predetermined zones differing from one another in **thickness** comprises a die body 18 (Fig. 3) comprised of two mated die parts or halves 21 and 22 provided with heating elements 23 and 24. The lower part of the die body is formed of opposable jaws 25 and 26 each having flat, parallel, internal surfaces which define lands 27 and 28 respectively defining a slot-shaped extrusion orifice 29 through which the **thermoplastic** material is extruded in the form of a molten flat **film** 30 (Fig. 2). Header 17 is a central cavity which extends the length of the die body 18 and communicates with an extrusion opening 31 the other end of which communicates with the extrusion orifice 29. The cross-sectional area of the extrusion opening 31 is greater than the cross-sectional area of the orifice 29. Each of the wall elements 32 and 33 of the opening 31 are provided with a longitudinally extending recess or groove of semicircular cross-section 34 and 35 defining a **channel** 36 of circular crosssection. The **channel** 36 accommodates a



cylindrical flow regulating rod 37 divided into two or more threaded segments of the same outer diameter, each segment having threads of different depth, as shown in Fig. 4 illustrating a rod having three segments. As the molten plastic, after passing down the slot 31, passes between the various segments of the rod 37 and the walls of the **channel** 36, a profile of varying **thickness** is imparted to the **film** 30 by the various threaded segments, and as the profiled **film** flows past the threaded rod 37 and then down and through the orifice 29 the **film** retains this profile of varying **thickness**. After passing through a draw-down zone or air gap 38 (Fig. 2) the still molten **film** 30 contacts preselected areas of an advancing web of substrate material 39, which is carried on a clockwise rotating pressure roll 40, just prior to reaching nip 41, between pressure roll 40 and chill roll 42, whereby the substrate is coated with a solidified **film** of the **thermoplastic** material. The substrate 39 is preferably paperboard, but may be paper, glassine, regenerated cellulose **film**, polymeric films such as polyester films, metal foil, cloth, or glass fibre cloth. The **thermoplastic** material used can be polyolefines, polystyrene, polyvinyl chloride, polyurethane, polymethyl methacrylate or nylon. **Polyethylene** is preferred.

PN - [GB820624](#) A 19590923

PR - GB19550028773 19551010

AP - GB19550028773 19551010

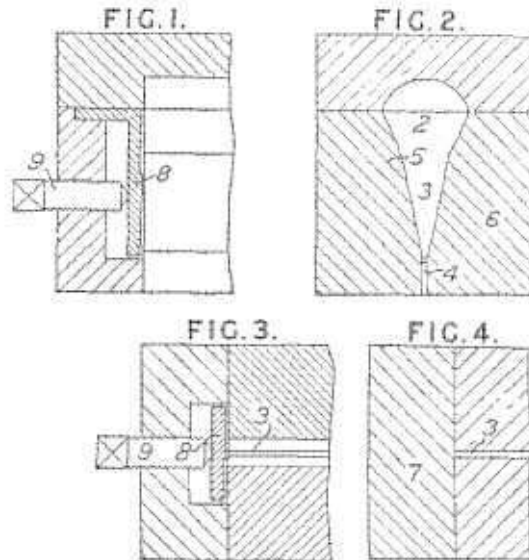
DT - *

CCI - [B29C47/0021](#) ; [B29C47/14](#)

PA - ICI LTD

TI - Improvements in and relating to the extrusion of **film**

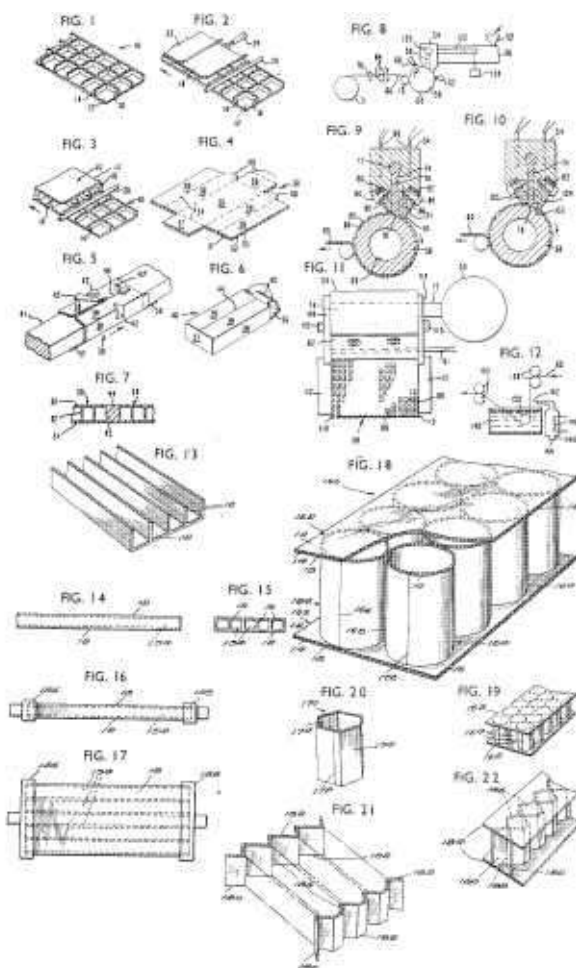
AB - <PICT:0820624/IV (a)/1> <PICT:0820624/IV (a)/2> <PICT:0820624/IV (a)/3> <PICT:0820624/IV (a)/4> A device for extruding molten organic **thermoplastic** material as a flat **film** with beaded or thickened edges consists of an elongated chamber 2, adapted to receive molten material, and an extrusion **channel** 3 defined by a pair of opposed die lips 5, 6, terminating at a slot orifice 4, and by end closure plates 7 fitted across the ends of the opposed die lips, the extrusion **channel** including a region at each end thereof defined by surfaces so shaped as to allow a greater rate of flow of molten material in these regions per unit length of slot than at the centre of the die lips, and the apparatus also including means to regulate the rate of flow of the molten material through said end regions. The device is intended to produce flat films having edge beadings of substantially constant but adjustable width and **thickness**. The width of the slot orifice may be locally adjustable along its whole length and suitable end regions allowing a locally increased rate of flow may be provided merely by increasing the slot orifice width at either end. Preferably, the surfaces



defining the end portions of the extrusion **channel** are so shaped as to increase locally the width of the **channel**. The rate of flow of molten material through the end regions may be regulated by controlling the rate of flow from the elongated chamber, or the crosssectional area of the end regions may be varied. A tongue 8 adjusted by a screw 9 may be used as a flow regulating device. The apparatus may be used for making films of **polyethylene** terephthalate, polythene, polyamides, polyvinylidene chloride, rubber hydrochloride and polystyrene.

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- PN - [GB1174287](#) A 19691217
- PR - US19660552183 19660523
- AP - GB19670023836 19670523
- DT - *; Rep
- CCI - [B29C47/32](#) ; [B65D65/38](#) ; [F28F21/065](#)
- CCA - [B29C47/0021](#) ; [B29C47/0028](#)
- PA - DU PONT [US]
- TI - Ribbed structures of **thermoplastic** resin.
- AB - 1,174,287. Ribbed films; making boxes; laminates. E. I. DU PONT DE NEMOURS & CO. 23 May, 1967 [23 May, 1966], No. 23826/67. Headings B5B, B5D and B5N. [Also in Divisions B8 and E1] A ribbed structure comprises a **film** and a network of ribs integrally moulded to a surface thereof and with one another, the ribbed structure being made of **thermoplastic** resin and having a bulk density of less than 30% of the density of the resin and the network of ribs alone having a bulk density of less than 20% of the density of the resin, especially less than 12% of the density of the resin. The ribs may



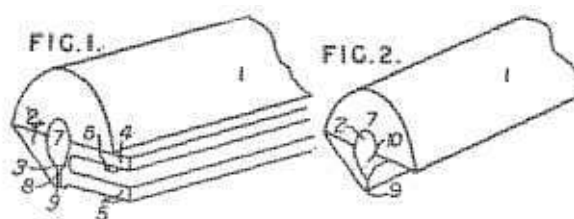
form a pattern of polygonal shapes, e.g. squares as in Fig. 1, or the ribs may be parallel forming a **channel** structure as in Fig. 13. Suitably the **film** is from 0.001 to 0.025 inch thick, and especially between 0.001 and 0.005 inch thick, and the ribs of the network are spaced apart a distance which is from 20 to 50 times the **thickness** of the **film**, the cross-sectional height to width ratio of the ribs being at least 5 : 1. As in Fig. 2, a web made of **thermoplastic** resin, 18, may be laminated to the tops of the ribs, and another web of material may be laminated to at least one **film** 12 or 18 of the rib structure, e.g. 22 in Fig. 2. Material 22 may be plastic, metal, cloth, wood or paper, and may be applied using a suitable adhesive, e.g. applied by sprayer 24. Thus the web 22 may be metal foil and paper may be laminated to the **film** 18 of the rib structure and additional metal foil laminated to the paper. As in Fig. 3, a ribbed structure may be made comprising opposed rib structures laminated in rib-to-rib relationship. The ribbed structure may also be made into a container in the form of a tube or carton. Thus Figs. 4, 5 and 6 illustrate successive stages in making a box from a ribbed structure 35, which is folded and passed over anvil 41, heat sealed at 43, and the edges abutted by fingers 42, pressure finger 47 serving to confine the **thickness** of the seam to the **thickness** of the rib structure, as shown in Fig. 7. The **channel** structure of Fig. 13 may be similarly treated to form laminated structures, and may be used to form a heat exchanger by the use of end manifolds 156, 158 as shown in Figs. 15 to 17. In the apparatus of Fig. 8, **thermoplastic** resin is supplied at 52 to die 54 of extruder

50 and is extruded via passage 56 to a surface of rotating roll 58. The use of a doctor blade (not shown) serves to regulate the **thickness** of the base **film**, and the **film** is cooled at water spray 62, and after sufficient contact with roll 58 which is internally cooled, the web is removed by take-off rolls 64 aided by stripper roll 16 and, optionally, mould release agent applied by spray nozzles 68 to the roll surface prior to passage under die 54. Longitudinal trimming of webs 60 may be effected by one or more blades 70 prior to wind-up at 71. The die 54 is pivotally mounted about stub shaft 120, and the rod 122 and weight 124 serve to counteract pressure fluctuations at the extruder so as to maintain a constant force on the resin entering the roll pattern. Figs. 9 and 10 show two forms of casting apparatus. In Fig. 9, resin 76 passes through cavity 74 to the outlet 78 extending across the surface of roll 58, the rearward and forward edges of outlet 78 being defined by a die-plate 80 and a doctor blade 82, each adjustably spaced from roll 58. Grooves 88 and 89 mould one surface of web 60, and the opposite surface is formed by doctor blade 82 which is adjustably spaced from roll 58 to give the web **thickness** desired. Fig. 10 differs from Fig. 9 in that the slot-shaped outlet 7.8 includes a wedge-shaped passage 102 extending in the direction of rotation of roll 58, formed by doctor blade 82 having a slot surface 104 facing roll 58. Movement of the surface of roll 58 past opening 78 drags molten resin into passage 102 wherein the flowing resin is forced into the pattern on roll 58. This drag flow pressure created in passage 102 at the surface of the roll

augments the pressure on the resin within cavity 74 of the die. Fig. 11 shows the means for laterally confining the molten **thermoplastic** resin as it leaves opening 78, comprising end plates 114, adjustably spaced from roll 58 by bolts 115, the end plates lying close to the shoulders 110 and having lower arcuate surfaces lying close to the corresponding surface of cylindrical ends 112. **Film** having only parallel ribs is obtained by using a suitably grooved roll. By heating the web sufficiently to melt the **film**, the **film** retreats or draws back into the network of ribs. Such a network may be made using the apparatus of Fig. 12, in which the web 60 is passed through feed rolls 138 and downwardly in front of hot air heater 140 which heats the air sufficiently to defilm the structure, which is thereafter quenched in water bath 148 and removed through take-off rolls 152, to form a network of ribs having no base **film**. Such a network can be laminated to webs as shown in Fig. 2, to form honeycomb-like structures for acoustical or structural applications. The ribs and films of the ribbed structures define closed cells which can be filled prior to closing with various media, e.g. inert gas or granular solids, or with liquids for decorative purposes. Specified materials include polystyrene, acrylonitrile-butadiene-styrene resin, polyolefins, ionomers, ethylene copolymers and blends, halogenated or per halogenated olefins, e.g. polyvinyl chloride and tetrafluoroethylene polymers including hexafluoropropylene and chlorotrifluoroethylene, polyvinyl acetate and its copolymers, polymethyl methacrylate, polyamides, and their copolymers

and blends, **polyethylene** terephthalate, polycarbonate and polyoxymethylenes. Moulding temperatures used include 200 to 250 C. for linear **polyethylene**; 180 to 190 C. for branched **polyethylene**; 200 to 250 C. for polypropylene; 240 to 280 C. for polystyrene; 150 to 170 C. for polyvinyl chloride; and 260 to 350 C. for nylon 66. Example I illustrates the production of a ribbed structure of linear **polyethylene**; Example II illustrates the production of a laminate from the web of Example I by adhesion to a polythene **film**; Example III describes the production of a ribbed structure of nylon 66; and Example IV the production of a ribbed structure having parallel ribs only from **polyethylene** and the production of a heat exchanger therefrom. Example IV also describes the production of the panels shown in Figs. 18 to 22 from the ribbed structures of the invention.

- 6/6 © EPODOC / EPO
- PN - [GB786449](#) A 19571120
- PR - GB19550019506 19550706
- AP - GB19550019506 19550706
- DT - **
- CCI - [B29C47/0021](#) ; [B29C47/165](#)
- PA - ICI LTD
- TI - Improvements in and relating to the extrusion of **film**
- AB - <PICT:0786449/IV (a)/1> <PICT:0786449/IV (a)/2> A die for the extrusion of molten organic **thermoplastic** material in the form of flat **film** having beaded edges has a slot orifice and a centre portion in which the internal surfaces of the opposed lips are parallel to each other over a certain length measured



in a direction at right angles to the extrusion orifice and terminating at the extrusion orifice, and an end portion at each side of the centre portion in which the internal surfaces of the opposed lips are parallel to each other over a similarly measured length, terminating at the extrusion orifice, that is less than the corresponding length in the centre portion of the die, the parallel-walled extrusion **channel** formed between the lip surfaces being preceded in the centre and end portions by a **channel** of greater width through which the molten material may be supplied. As shown in Fig. 1, which is a perspective view of the end portion of a die, with end plate removed, and in Fig. 2, which is the same view with one lip removed from the die, 1 represents the body portion of the die to which are bolted the lips 2 and 3. The lip 3 is substantially U-shaped in section, the upper limb being bolted immovably to the body portion of the die, and the lower limb being slightly flexible and capable of being moved towards or away from the upper limb by means of a series of bushes 6, spaced across the whole width of the die; in this way the width of the slot orifice may be adjusted to give a **film** of uniform **thickness** across the whole central region. The body portion of the die forms with the lips a passageway 7 for the molten material, and the lips form a parallel-walled extrusion **channel** terminating at the slot orifice 9. The length of the parallel portion of the lip

surfaces is decreased at each end of the die by grinding one or both of the lip surfaces in the manner shown at 10. The two ends of the die are closed by end plates (not shown), one of which is provided with an inlet for supplying the molten material to the passageway 7. Since the volumetric rate of extrusion of the melt is proportional to the length of the parallel section of the die lips in the direction of extrusion, the volumetric rate of extrusion is greater through the end portions of the die slot than through the remainder of the slot, so that the extruded **film** is formed with a bead along each edge. The thermosplastic material extruded may be polythene, a polyamide, polyvinylidene chloride, rubber hydrochloride, polystyrene or, particularly, **polyethylene terephthalate**. The beaded edges render it possible to increase the uniformity of width reduction when the **film** is stretched longitudinally after cooling.