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(54) Plastic moulded bearing plate for making coil supports capable of being placed side by side, superimposed and stacked firmly with other plates of the same type.

(57) This invention concerns a supporting plate moulded in plastic with a special structure so that the same may be stably positioned side by side, stacked on other plates of the same type for producing metal wire, paper, plastic film or metal reel supports.

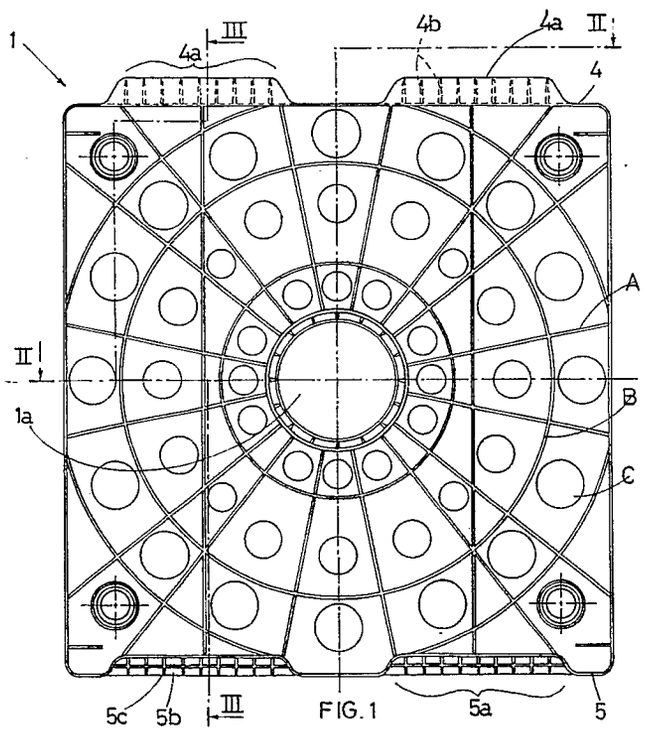

FIG. 1

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This design patent application for an utility model relates to a supporting plate for constructing reels moulded in plastics having a special structure allowing the same to be stably positioned side by side and stacked with other plates of the same type.

This product was designed to overcome some of the practical problems currently encountered in the case of products currently manufactured for wire, paper, plastic film or metal reel supports.

It should in fact be noted that these reels are frequently very heavy and take up a lot of space so that moving them and transport often proves to be a problem.

Currently, rather rudimentary tooling is used for supporting these reels, consisting simply of a pair of opposing wooden plates with a hole at the centre of both sides in which a cylindrical pin may be fitted and fixed; this pin not only connects these plates but also fits as a support in the sleeve around which the reel is wound.

Not only is the structure very simple and consequently not very reliable but the reel supports currently used also create practical problems for storage.

In fact once a certain number of these reels have been mounted on the same number of tools, it may be difficult to store them in an orderly manner and to load them rationally on any means of transport. Currently, in these cases, the reel supports are stacked on top of one another - with the connection pin in horizontal position - in other words, so that their corresponding side plates are aligned in an exact vertical position.

In order to stabilize this storing position, special H profiles are used whose bottom fork is fitted to the top of the plate edge of the underlying reel while its top fork fits over the edge of the corresponding plate of the overlying reel.

It is evident that these "H" profiles keep the stacked reel plate supports together even if this simply prevents the stacked reels from sliding laterally, but does not prevent the overlying reel from sliding and falling backwards or forwards with respect to the underlying reel.

Further problems are encountered when storing these rudimentary wooden plates for traditional reel supports in an orderly manner in that without any special fixtures they must simply be stacked and joined together, often with very unreliable tying.

The plate according to the invention was designed after careful examination of the above problems which make the use of the current items very unsatisfactory.

In particular the same is designed with special features enabling the same to be joined safely and stably with other identical items of the same type.

This not only makes it possible to stack the many identical plates horizontally on top of one another in an orderly manner but also offers stable and safe coupling both when the same are placed vertically side by side or when they are placed vertically on one another.

In particular, when these are placed vertically it is also possible to join reel supports constructed with a pair of these plates firmly together, thereby simplifying and optimizing transport and storing.

For major clarity the description of the invention continues with reference to the enclosed drawings which are intended for purposes of illustration and not in a limiting sense, whereby:

- figure 1 is an external view of the plate according to the invention;
- figure 2 is a half view-half cross section illustration of the plate in Figure 1, cross-sectioned with plane II-II;
- figure 3 is the cross-section of Figure 1 with the plane III-III;
- figure 4 is a top view of the horizontal top edge of the plate in Figure 1;
- figure 5 is an external axonometric illustration of a corner of the plate in question;
- figure 6 is an external view of the corners of two adjacent plates which are joined by means of a "C" shaped bracket;
- figure 7 is a top view of figure 6 without the "C" shaped bracket;
- figure 8 is an external view of the four corners of four plates according to the invention, placed side by side and stacked two by two and connected in pairs horizontally by means of the above two brackets;
- figure 9 is a view of the "C" shaped bracket required to fix the two plates side by side.
- figure 10 is a view of the bracket in figure 9, half cross-sectioned according to the plane X-X.

With reference to the figures 1-4, the item in question consists of an approximately rectangular plate (1) with chamfered corners, moulded in plastic and fitted with a series of external stiffening ribs and lightening holes.

This plate (1) has a wide circular through hole (1a) at the centre, from which many stiffening ribs branch off radially (A) and around which there are additional stiffening ribs (B) placed concentrically; between each pair of these concentric ribs (B) there is a series of circular lightening holes (C) placed concentrically with respect to the centre hole (1a) of the item (1).

A wide central collar (2) projects from the internal face of this plate (1).

By placing two of these plates (1) face to face, in other words in a position whereby they are turned with their respective centre collars (2) facing each other it is possible to produce a strong sup-

port for reels in which the two opposing collars (2) act as a support and rotating pin for the centre sleeve of the reel.

In particular this collar (2) has a varying diameter in that it consists of a high circular base edge (2a) which is realized directly on the perimeter of the hole (1a) and by an overlying edge (2a) with a smaller diameter but having the same height; the connection between the base section (2a) and the end section (2c) of this collar (2) is fixed by an intermediate thin step (2b) slanted towards the internal part of the collar (2).

On the internal face, but this time at the four corners, the plate according to the invention (1) has four cylindrical supports (3) - parallel to the collar (2) but whose height is slightly less than the same - having a tapered truncated cone tip (3a) at the end; these supports (3) are hollow with access to the cavity by means of a circular mouth (3b) opening on the external face of the plate (1).

The special shape of the centre collar (2) and the special shape and position of the supports (3) are designed to facilitate stacking many plates of this kind, horizontally.

In fact by stacking the plates in this position, it is possible to fit, thanks to their corresponding heights, the end section (2c) of the collar (2) of the plate underneath into the base section (2a) of the collar (2) of the overlying plate.

This feature makes it possible to stabilize this coupling between two plates according to the invention, while the purpose of the above supports (3) is to increase the overall sturdiness of the item, above all in those cases whereby this is stacked with many other identical items and consequently when it sustains heavy loads due to the weight of all the plates which are stacked on to the same.

In fact, - thanks to the carefully designed height of the different collar (2) sections and of the supports (3) - when the collar edge (2c) of the underlying plate fits into the base section (2a) of the collar (2) of the overlying item, the tapered section (3a) of each support (3) of the underlying plate also fits into the cavity mouth (3b) of the relevant supports (3) of the overlying item.

It is obvious that a complete coupling of this kind between two plates (1) of this type can only be achieved if the overlying plate is lowered on to the underlying plate so that the respective collars (2) and supports (3) are perfectly aligned; it should be noted that after this multiple coupling, each item of a pile sustains the next plate on five points of its surface and is sustained by the underlying plate at the same five points thereby guaranteeing absolute sturdiness and balance.

As already mentioned it is possible to securely stack plates (1) of this type even when they are placed vertically, that is edgewise.

In order to achieve this, the top horizontal wall (4) of each plate (1) is fitted with two projecting extended housings (4a), with the same number of extended profiles (5a) on the bottom horizontal wall which correspond exactly to the housings (4a) on the above top horizontal edge (4).

This feature obviously makes it possible to achieve a stable prismatic coupling between the bottom horizontal edge (5a) of a vertically positioned plate and the top horizontal edge (4b) of an identical underlying plate, in the same position.

In particular, the horizontal edge (4) of the item according to the invention (1) is fitted with two identical extended housings (4a) which are projecting with respect to the edge (4); these housings (4a) are placed symmetrically with respect to the vertical median axis of the plate (1) so that each of the housings (4a) can extend only along the centre section of the respective half of the horizontal edge (4).

It should be noted in this regard that these housings (4a) consist in fact of two parallel lateral sides (4b) connected by a series of "V" shaped transverse sections (4c).

The bottom horizontal edge (5) of the plate (1) which is rectilinear, has - in positions which correspond exactly to those of the above housings (4a) on the top edge (4) - two shaped profiles (5a) whose length is equal to that of the housings (4a) consisting of a frame formed by a longitudinal middle section (5b) having a transverse cross section intersecting a series of triangular tabs (5c) shaped so that they fit perfectly into the above housings (4a).

When the bottom edge (5) of an overlying plate (1) is coupled to the top edge (4) of an underlying plate, the shaped profiles (5a) fit perfectly into the corresponding grooved housings (4a) while the rectilinear profile of the bottom edge (5) stops against the top edge (4) of the underlying plate.

In this situation the prismatic coupling of the two plates is further stabilized in that the extended housings (4a) of the underlying plate not only join with the profiles (5a) of the overlying plate, but are also wedge into the edge (5) of the overlying plate, thereby taking advantage of the inverted but corresponding position of the full and empty parts for this purpose.

Regarding the fact that this item (1) can be fixed side by side with another identical item, it should be noted that each of these plates (1) has, along its perimeter and at the four right angles connecting the vertical edges with the horizontal edges, the same number of "L" shaped grooves (6), each consisting of a vertical flange at one of the ends of the two smooth lateral sides and of an identical horizontal flange at one end of one of the horizontal walls of the item (see figure 6).

In particular each of these "L" shaped grooves provides access to a horizontal internal flange (7) projecting from the face of the vertical wall of the plate from a point close to the bottom of the vertical section of the notch.

It follows that by placing these plates (1) side by side so that the respective smooth side edges touch, the top (4) and bottom (5) horizontal edges are positioned consecutively with respect to each other.

Therefore, while the vertical sections of the "L" shaped notches (6) of both plates terminate against each other in matching positions, the two horizontal sections of the notches are positioned consecutively giving rise to a rectilinear notch, - on each side of the item - positioned between the contact point between the plates (see figure 7).

It should also be added that by placing the two plates side by side in this position, the horizontal shelves (7) projecting from the vertical walls of each plate (1) inside the respective "L" shaped notches (6) are also perfectly aligned and symmetrical.

In order to fix two plates positioned side by side in this manner, a special "C" shaped bracket (8) is used which is fitted horizontally into each of the above rectilinear notches in order to secure the two plates positioned side by side (see figures 6 and 8).

In particular, the length of this bracket (8) equals that of the longitudinal notch which gives access to the opposing pair of horizontal shelves (7) and its height is the same as that of the "L" shaped notches (6); the same also has two teeth (8a) projecting from its bottom edge at the two longitudinal ends; these are positioned so as to coincide perfectly with that of the two opposing holes (7a) at the ends of the horizontal shelves (7) in both plates under the respective "L" shaped notches (6).

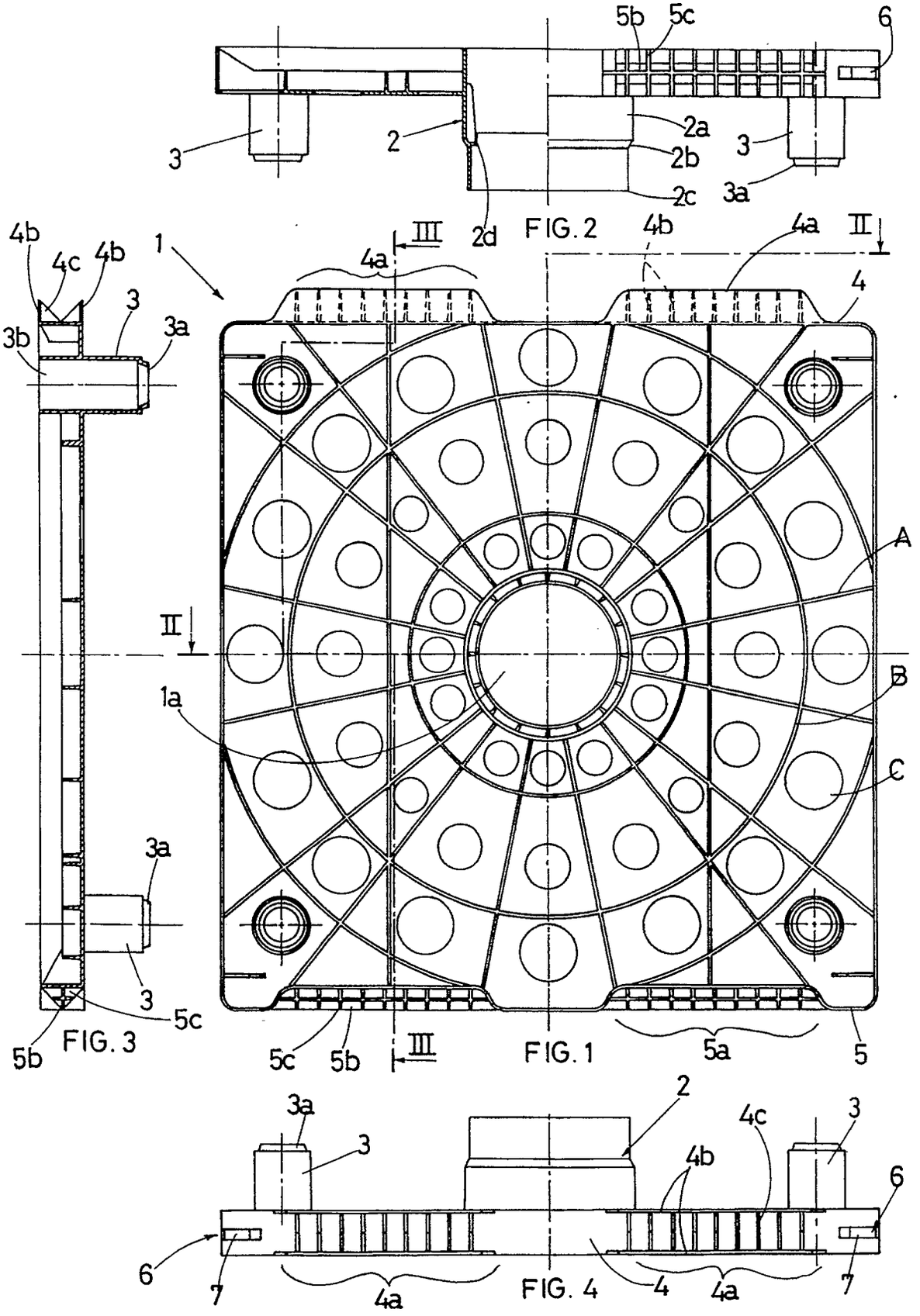
By pushing a bracket of this type into one of the above rectilinear notches, the projecting parts of the same are latched and fixed inside the opposing holes at the ends of the horizontal shelves on the bottom of this notch; this makes it possible to secure the side walls of two adjacent plates firmly against each other.

Claims

1. A support plate moulded in plastic which can be placed securely side by side, overlying and stacked with other plates of the same type for realizing reel supports; the item according to the invention consists of an approximately rectangular plate (1) having chamfered edges, moulded in plastic material and fitted with a series of stiffening ribs and lightening holes characterized by the following;
   - a wide circular through hole (1); from the peripheral edge of this hole (1) - on the internal face of the plate (1) - there is a wide collar (2) having a varying diameter in that the same consists of a high circular base edge (2a), welded - thanks to a thin connection step (2b) slanted towards the inside - with an overlying circular edge (2c) whose diameter is slightly smaller but whose height is almost identical so that the top edge (2c) of the collar (2) of an identical plate (1) can be coupled perfectly - male to female - inside the bottom edge (2a) of the collar (2) of a plate (1);
   - four cylindrical supports (3) - also made on the internal face of the plate (1) but at the four corners of the same - the same being placed parallel to the centre collar (2), even if their height is less than the centre collar; these supports (3) which terminate at the end with a tapered truncated cone tip (3), are hollow with access to their cavity through corresponding circular mouths (3b) - opening on the external face of the plate (1) - sized so that the truncated cone end (3a) of the supports (3) of another identical plate (1) can be housed within the same;
   - a top horizontal edge (4) on which two identical extended housings (4a) are produced, and which are projecting with respect to the edge (4), consisting of two parallel lateral sides (4b), connected by a series of transverse "V" shaped sections (4c); these housings (4a) are positioned symmetrically with respect to the vertical median axis of the plate (1) so that each of the housings (4a) can extend only for a centre section of the respective half of the above horizontal edge (4);
   - a bottom rectilinear horizontal edge (5) on which there are the same number of extended perfectly matching profiles (5a) corresponding to the housings (4a) on the above top horizontal edge (4) with which they must couple prismatically; these two shaped profiles (5a) consist of a frame formed by a longitudinal middle section with a cross-shaped transverse cross section intersecting with a series of triangular flanges (5c) shaped so as to fit perfectly inside the above housing (4a);
   - four "L" shaped notches (6) along the perimeter of the plate in question at the four right angles connecting the vertical edges with the horizontal edges; each of

these "L" shaped notches (6) consist of both a vertical flange at one end of one of the two smooth sides and by an identical horizontal flange at one end of one of the horizontal walls of the item; each of the "L" shaped notches (6) allows access to an internal horizontal shelf (7) having a through hole (7a) at one end projecting from the face of the vertical wall of the plate (1), from a point close to the bottom of the vertical section of the notch (6).

2. A moulded plastic support plate for producing reel supports, which can be securely placed side by side, overlying and stacked with other plates of the same type according to claim 1, characterized in that the same has a "C" shaped bracket (8) - for coupling side by side with other identical items - having two teeth (8a) projecting at the bottom at its two longitudinal ends and which can be fitted perfectly in the rectilinear notch formed by the alignment of the horizontal flanges of the "L" shaped notches (6) of two plates (1) terminating side by side, while the two teeth (8a) can be latched in the holes (7a) of the two horizontal shelves which are aligned under and inside this rectilinear notch; for this purpose, the length of this bracket (8) is double that of the horizontal flange of each of the above "L" shaped notches (6) of the plate (1) while its height is equal to that of the vertical flange of the same "L" shaped notches (6); finally the shape and position of its teeth (8a) on the bracket (8) correspond to the shape and position on the horizontal flange (7) of the holes (7a) on the same.


5b
5c
6
3
2
2a
2b
2c
3a
2d
FIG. 2
4b
4c
4b
1
III
4a
4a
III
4
3
3b
3a
II
A
II
B
1a
C
3a
3
5c
5b
FIG. 3
5c
5b
III
FIG. 1
5a
5
3a
3
2
4c
3
4b
6
6
7
4a
FIG. 4
4
4a
7

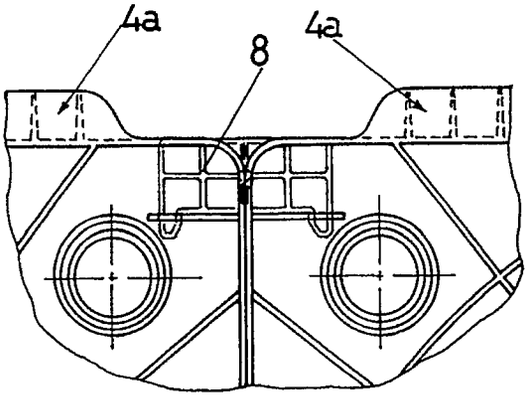


FIG. 6

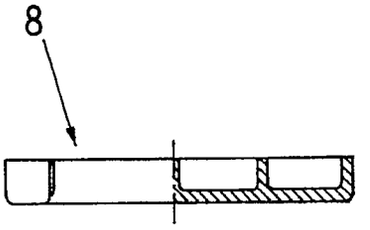


FIG. 10

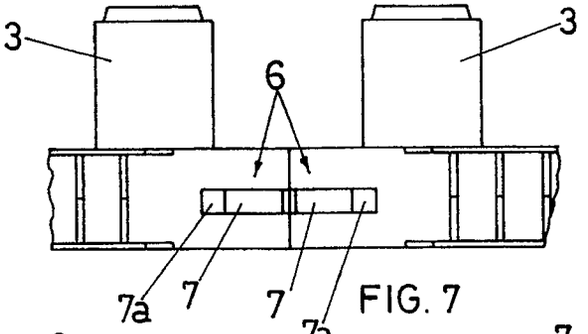


FIG. 7

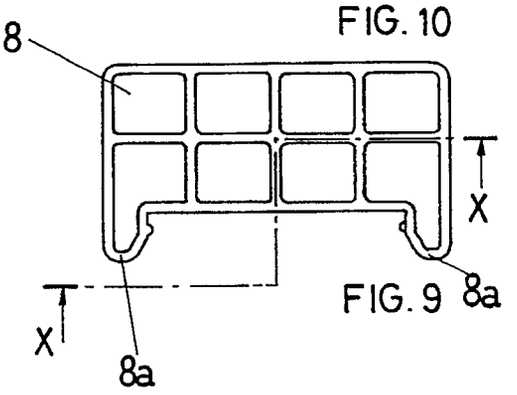


FIG. 9

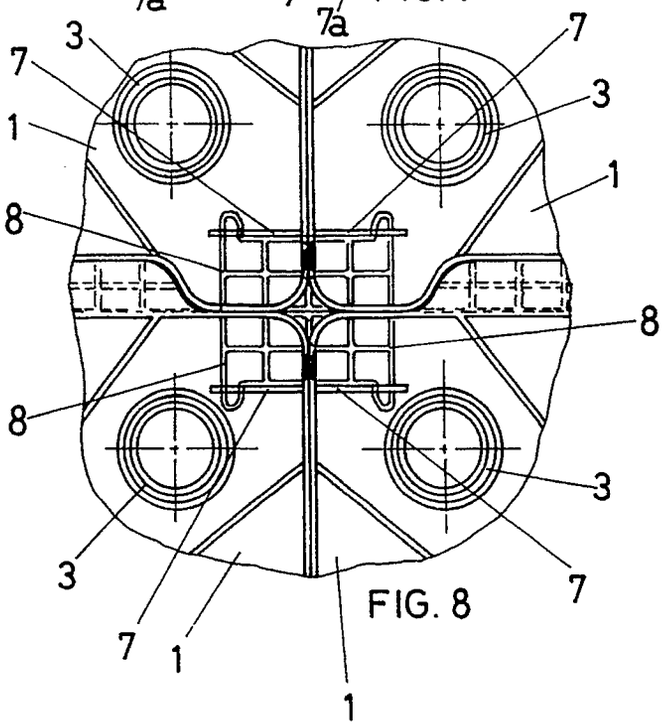


FIG. 8

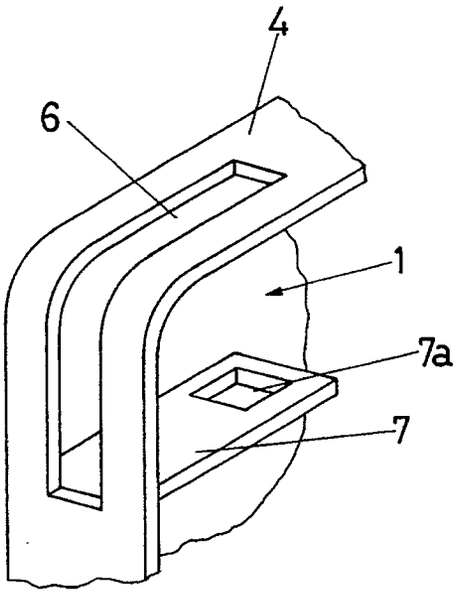


FIG. 5

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EUROPEAN SEARCH REPORT

Application Number

EP 90 83 0108

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 332 186 (HOECHST) * Abstract; figures *	1	B 65 D 85/672
A	LU-A-7 078 5 (DU PONT DE NEMOURS) * Page 3, lines 24-30; figures *	1,2	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 65 D
B 65 H

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	08 November 90	MARTIN A.G.M.

CATEGORY OF CITED DOCUMENTS

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