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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.**

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Description

This patent application 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 support.

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 aver 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.

Nevertheless in this technical field also exists an article more progressive disclosed in EP-A-332 186 in the name of HOECHST AKTIENGESELLSCHAFT (Frankfurt am Main - Germany), which corresponds with the preamble of claim 1; this document discloses a support plate moulded in plastics for realizing reel supports, comprising an approximately rectangular plate having peripheral edges and chamfered corners and fitted with a series of stiffening ribs; a hole at the centre of the plate from the peripheral edge of which hole a wide collar extends at right angles from the internal face of the plate; four cylindrical supports extending from the internal face of the plate at the four corners thereof and parallely to the centre collar and having a height lesser than that of this collar; these supports, which terminate at their ends with a part of lesser diameter, being hollow with acces to their cavity through corresponding mouthopenings on the external face of the plate and sized so that the ends of the supports of another identical plate can be housed within the same; opposite edges of the plate being provided with complementary profiles so that the plates can be stacked in a vertical position or can be placed securely side by side.

The plate according to the invention was designed to improve the performances of the above mentioned support plate.

In particular the same is designed with special features (as defined in claim 1) 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 the 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 re-

quired 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 figure 1-4, the item in question consists of an approximately rectangular plate (1) with chamfered corners, moulded in plastics 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 collar (2) facing each other it is possible to produce a strong support 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 (2c) 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 of 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 edge (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 edge 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 (5) of a vertically positioned plate and the top horizontal edge (4) of a 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 housing (4a) which are projecting with respect to the edge (4); these housings (4a) are placed symmetrically with respect to the vertical axis of the plate (1) in a vertical position 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 lenght 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 a 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 egde (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, whereby 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 notches (6), each consisting of a vertical flange at one of the ends of the two smooth vertical edges and of an identical horizontal flange at one end of one of the horizontal edges of the item (see figure 6).

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

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

Therefore, while the vertical flanges of the "L" shaped notches (6) of both plates terminate against each other in matching positions, the two horizontal flanges 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 also should be added that by placing to two plates side by side in this position, the horizontal lips (7) projecting from the vertical edges 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 lenght of this brackets (8) equals that of the longitudinal notch which gives access to the opposing pair of horizontal lips (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 lips (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 lips 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 consisting of an approximately rectangular plate (1) having peripheral edges and chamfered corners and fitted with a series of stiffening ribs and lightening holes; a wide circular through hole (1) being provided at the centre of the plate (1), from the peripheral edge of which hole (1a) a wide collar (2) extends at right angles from the internal face of the plate (1); four cylindrical supports (3) - also made on the internal face of the plate (1) but at the four corners of the same - being provided, the same being placed parallel to the centre collar (2), having a height less than that of the centre collar (2), and being hollow with access to their cavity through corresponding circular mouths (3b) - opening on the external face of the plate (1) - sized so that the ends (3a) of the supports (3) of another identical plate (1) can be housed within the same; characterized:
   - in that the wide collar (2) has a varying diameter, since the same consists of a high circular base edge (2a), welded - thanks to a thin connection step (2b) slanted towards the inside - with a 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);
   - in that the four cylindrical supports (3) terminate at the end with a tapered truncated cone tip (3);
   - in that it comprises a top horizontal edge (4) on which two identical extended housings (4a) are produced, which are projecting with respect to the edge (4), and which consist of two parallel lateral sides (4b), connected by a series of transverse "V" shaped sections (4c); these housings (4a) being positioned symmetrically with respect to the vertical axis of the plate (1) in a vertical position so that each of the housings (4a) can extend only for a centre section of the respective half of the above horizontal edge (4);
   - in that it comprises a bottom rectilinear hor-

izontal edge (5) on which there are the same number of inwardly extending 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) consisting of a frame formed by a longitudinal middle section (5b) with a cross-shaped transverse cross section intersecting with a series of triangular flanges (5c) shaped so as to fit perfectly inside tha above housings (4a);

- in that it comprises 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) consisting of both a vertical flange at one end of one of the two smooth vertical edges and by an identical horizontal flange at one end of one of the horizontal edges of the item; each of the "L" shaped notches (6) allowing access to an internal horizontal lip (7) having a through hole (7a) at its free end and projecting from the face of the vertical edge of the plate (1), from a point close to the bottom of the vertical flange 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 lips which are aligned under and inside this rectilinear notch; for this purpose, the lenght 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 lip (7) of the holes (7a) on the same.

Patentansprüche

1. Tragende Platte zum Zweck der Spulenhalterung, in Kunststoff gepreßt, die es erlaubt, mehrere Platten des gleichen Typs stabil und sicher nebeneinander zu stellen, übereinander zu lagern und zu stapeln, bestehend aus einer Platte (1) in fast rechteckiger Form, versehen mit Außenrändern und abgeschrägten Ecken, einer Reihe von äußeren Verstärkungsrippen und Erleichterungslöchern, einem durchgehenden zentralen Bohrloch (1a), aus dem auf der Innenseite der Platte ein Bundring (1) herausragt, sowie versehen mit vier zylinderförmigen hohlen auch auf der Innenseite an den vier Ecken der Platte (1) befindlichen, parallel zu dem zentralen Bohrloch angeordneten (2) Stützen (3), aber von geringerer Höhe als dieses und die im unteren Teil kreisförmige Öffnungen (3b) aufweisen, welche in die Außenseite derselben Platte (1) münden und welche eine genaue Einführung des Stützenendes (3) einer anderen Platte (1) erlauben. Die Platte wird dadurch charakterisiert,

   - daß der zentrale Bundring (2) einen unterschiedlichen Durchmesser aufweist, wobei dieser aus einem kreisförmigen hohen Hauptbord (2a) besteht, der dank einer zum Ringinneren abgeschrägten Verbindungsstufe, mit dem darüberliegenden kreisförmigen Bord (2c) von etwas geringerem Durchmesser, aber von fast gleicher Höhe, verbunden ist, sodaß der obere Bord (2c) des Bundringes (2) einer Platte (1) exakt ins Innere des unteren Bords (2a) des Bordringes (2)paßt.
   - daß die vier zylinderförmigen Stützen (3) im oberen Teil mit einem schmäler werdenden Kegelstumpf enden (3a);
   - daß sie einen horizontalen oberen Bord (4) aufweist, auf dem sich zwei gleiche verlängerte Vorsprünge (4a) befinden, die aus demselben Bord (4) herausragen, die praktisch aus zwei zueinander parallelen Seitenwänden bestehen, die durch eine Reihe von transversalen V- Trennwänden (4c) miteinander verbunden sind; es ist dabei vorgesehen, daß diese Vorsprünge (4a) symmetrisch in bezug auf die vertikale mittlere Achse der Platte (1) angelegt sind, sodaß sich jeder dieser Vorsprünge (4a) nur über das Mittelstück der jeweiligen Hälfte des zuvor erwähnten horizontalen Bords (4) erstrecken kann;
   - daß diese Platte einen geradlinigen unteren Bord (5) aufweist, auf dem verlängerte Profile (5a) realisiert sind, die mit den Vorsprüngen , die im Inneren am horizontalen Bord (4) vorgesehen sind, konform sind, wobei die Möglichkeit einer prismatischen Verbindung bestehen muß; es ist dabei vorgesehen , daß diese zwei schablonierten Profile (5a) aus einem Gerippe bestehen, gebildet aus einer mittleren longitudinalen

Trennwand (5b) mit kreuzförmigem Querschnitt, wobei diese eine Reihe von dreiecksförmigen Flügel (5c) durchschneidet, die sich genauestens ins Innere der obengenannten Vorsprünge (4a) einsetzen lassen;

- daß diese vier L - förmigen Einschnitte aufweist, die sich an den vier rechtwinkligen Ecken befinden, die die horizontalen und vertikalen Borde miteinander verbinden; es ist dabei vorgesehen, daß jeder dieser L - förmigen Einschnitte (6) aus einem vertikalen Flügel am Ende einer der glatten vertikalen Flanken und aus einem horizontalen Flügel am Ende einer der horizontalen Wände des Fabrikats besteht; es ist weiters vorgesehen, daß jeder dieser Einschnitte (6) den Zugang zu einem inneren horizontalen Stützarm (7) erlaubt, wobei letzterer im Endstück mit einem durchgehenden Bohrloch versehen ist, das auf der vertikalen Wandseite der Platte (1) aus dem unteren Teil des vertikalen Stücks desselben Einschnitts (6) herausragt.

2. Tragende Platte zum Zweck der Spulenhalterung, in Kunststoff gepreßt, die es erlaubt, gemäß Patentanspruch 1, mehrere Platten des gleichen Typs stabil und sicher nebeneinander zu stellen, übereinander zu lagern und zu stapeln. Sie ist dadurch charakterisiert, daß sie sich für die Seite an Seite - Lagerung mit denselben Fabrikaten eines C-förmigen Bügels (8) bedient, bestehend aus zwei Schäften (8a), die aus dem unteren Teil an den longitudinalen Enden herausragen, und der exakt in den geradlinigen Einschnitt hineinpaßt, der aus der aneinandergereihten Anordnung der horizontalen Flügel der L - förmigen Einschnitte (6) zweier Platten entsteht, welche Seite an seite liegend bis zum Anschlag einrasten, während sich die zwei Schäfte (8a) durch ein Einschnappen in die Bohrlöcher der horizontalen Stützarme (7) einführen lassen, die sich aneinandergereiht im unteren und inneren Teil dieses geradlinigen Einschnitts befinden; dabei ist zu diesem Zweck vorgesehen, daß dieser Bügel (8) die doppelte Länge des horizontalen Flügels dieser L - förmigen Einschnitte (6) der Platte (1) und die gleiche Höhe des vertikalen Flügels derselben L - förmigen Einschnitte (6) aufweist; Zuletzt ist vorgesehen, daß die Schäfte (8a) eine Struktur und Anordnung am Bügel (8) besitzen, die der Struktur und Anordnung am horizontalen Flügel (7) der Bohrlöcher entsprechen.

Revendications

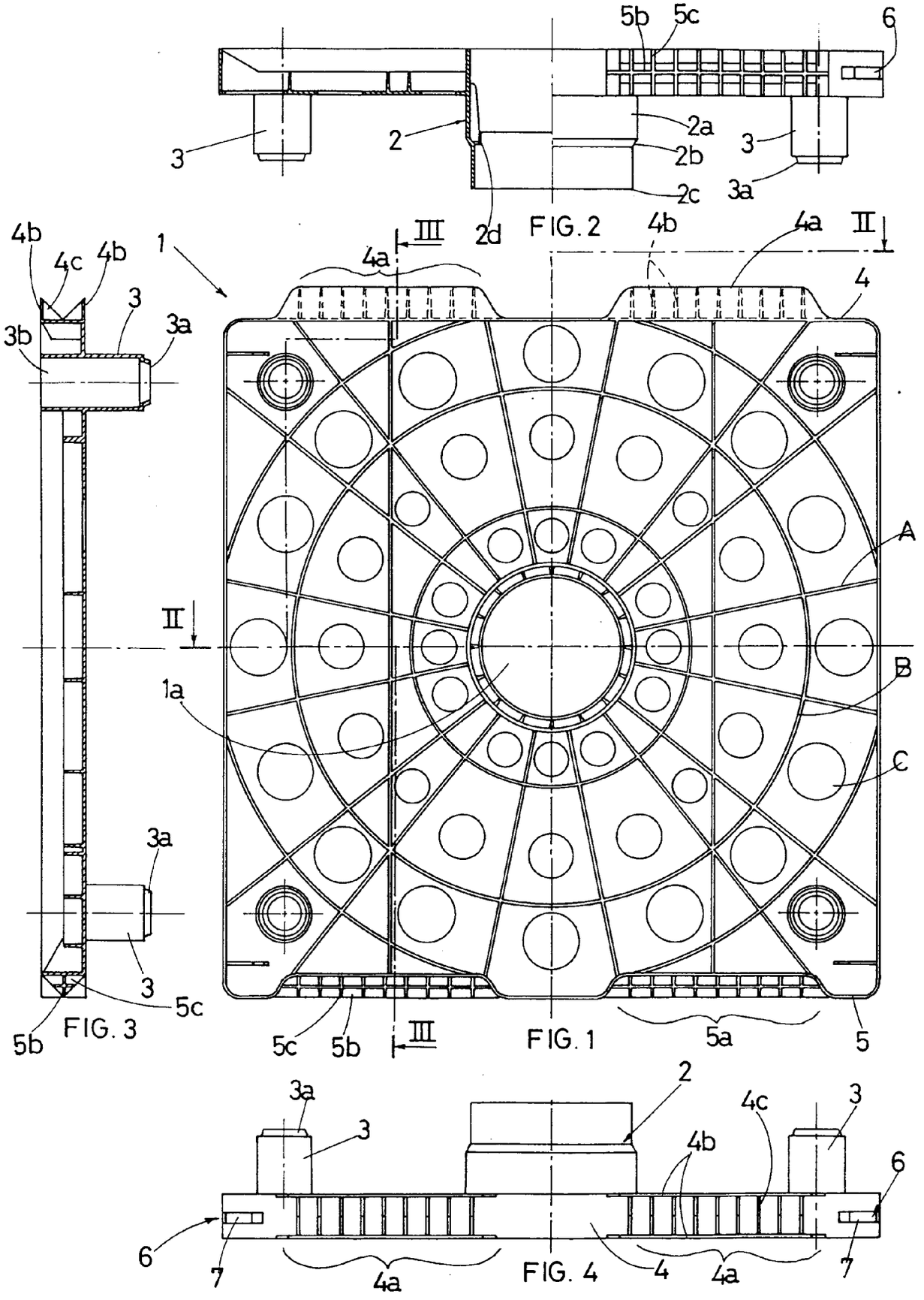
1. Plaque portante pour la réalisation de supports pour bobines, moulée en matières plastiques, en mesure d'être accolée, superposée et empilée de façon stable avec d'autres plaques du même type; elle consiste en une plaque de forme à peu près rectangulaire, dotée de bords périmétraux et de coins arrondis, et portant une série de nervures externes de durcissement et de trous d'allègement, un trou central circulaire passant (1a) d'où se forjette - sur la face interne de la plaque - un large collier (1), ainsi que quatre colonnes cylindriques creuses (3) réalisées elles aussi sur la face interne de la plaque (1), mais aux quatre coins de celle-ci; ces colonnes sont parallèles au collier central (2), mais d'une hauteur inférieure, et présentent dans leur partie basse des bouches circulaires (3b) donnant sur la face externe de la plaque (1) et dont les dimensions permettent l'emboîtement des extrémités des colonnes (3) d'une autre plaque identique (1), caractérisée:

- par le fait que le collier central (2) présente un diamètre variable, étant composé d'une base circulaire (2a) assez haute, qui est soudée - grâce à un mince degré (2b) de raccordement incliné vers l'intérieur - à un bord circulaire (2c) d'un diamètre à peine inférieur, mais d'une hauteur à peu près identique, de sorte qu'à l'intérieur du tronçon inférieur (2a) du collier (2) d'une plaque (1) on peut accoupler exactement - selon le système mâle et femelle - le tronçon supérieur (2c) du collier (2) d'une plaque (1) identique;
- par le fait que les quatre colonnes cylindriques (3) se terminent à leur sommet par des pointes contracturées tronconiques (3a);
- par le fait qu'elle présente un bord horizontal supérieur (4) sur lequel sont réalisés deux logements allongés (4a) identiques, en saillie par rapport audit bord (4), et qui sont en pratique constitués de deux rebords latéraux (4b) parallèles, reliés par une série de cloisons transversales en "V" (4c); ces logements (4a) sont symétriques par rapport à l'axe médian vertical de la plaque (1), de sorte que chacun d'eux (4a) ne peut s'étendre que sur un tronçon central de sa moitié respective du bord horizontal (4) susdit;
- par le fait qu'elle présente un bord horizontal inférieur (5) rectiligne, sur lequel sont réalisés deux profils allongés (5a) exactement conformes et correspondant aux logements (4a) prévus intérieurement sur le bord horizontal supérieur (4) susdit avec lesquels ils doivent pouvoir s'accoupler prismatiquement - ces deux profils galbés

(5a) étant en pratique constitués d'un squelette formé d'une cloison médiane longitudinale (5b) à section transversale en croix, s'intersectionnant avec une série d'ailettes triangulaires (5c) conformées de façon à pouvoir s'insérer parfaitement à l'intérieur des logements (4a) susdits;

- par le fait qu'elle présente quatre entailles en "L" (6) pratiquées sur le périmètre de la plaque en question en correspondance des quatre angles droits qui raccordent les bords verticaux aux bords horizontaux, chacune de ces entailles en "L" (6) étant composée d'une aile verticale réalisée à une extrémité de l'un des côtés verticaux lisses et d'une aile horizontale identique réalisée à une extrémité de l'une des cloisons horizontales du produit - chacune de ces entailles en "L" (6) devant permettre l'accès à une ailette interne horizontale (7), pourvue à son extrémité d'un trou passant (7a), qui se forjette de la face interne de la paroi verticale de la plaque (1), à partir d'un point tout proche du bas du tronçon vertical de l'entaille (6).

2. Plaque portante pour la réalisation de supports pour bobines, moulée en matières plastiques, pouvant être accolée, superposée et empilée de façon stable avec d'autres plaques du même type, selon la revendication 1, caractérisée par le fait qu'elle utilise - pour son accouplement côte à côte avec d'autres produits identiques - un étrier en "C" (8) doté de deux mentonnets (8a) se forjetant inférieurement en correspondance de ses deux extrémités longitudinales et capable de s'emboîter exactement dans l'entaille rectiligne formée par l'alignement des ailes horizontales des entailles en "L" (6) de deux plaques (1) placées en battue côte à côte, tandis que ses mentonnets (8a) sont en mesure de s'emboîter par enclenchement dans les trous (7a) des deux ailettes horizontales (7) qui se trouvent en position alignée en dessous et à l'intérieur de cette entaille rectiligne - cet étrier (8) devant avoir une longueur double par rapport à celle de l'aile horizontale de chacune des entailles en "L" (6) susdites de la plaque (1) et une hauteur égale à celle de l'aile verticale de ces mêmes entailles en "L" (6), et les mentonnets (8a), enfin, devant avoir une conformation et une position sur l'étrier (8) correspondant à la conformation et à la position sur l'ailette horizontale (7) des trous (7a) que celle-ci présente.


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

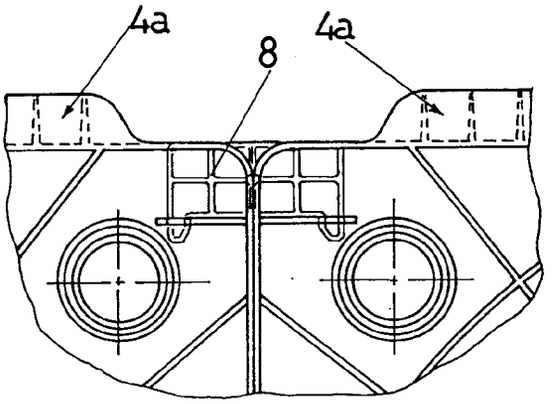


FIG. 6

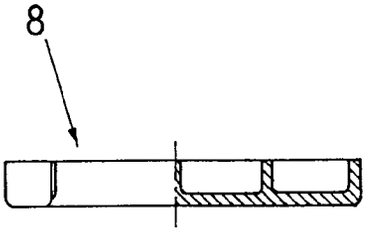


FIG. 10

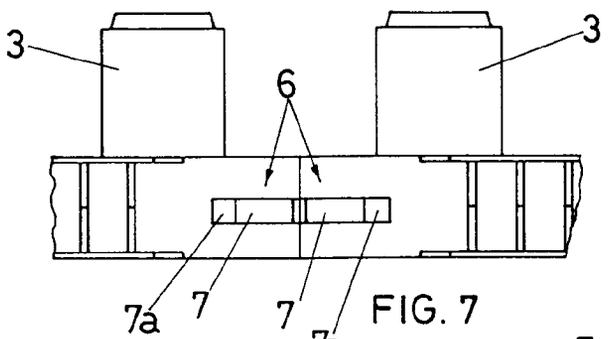


FIG. 7

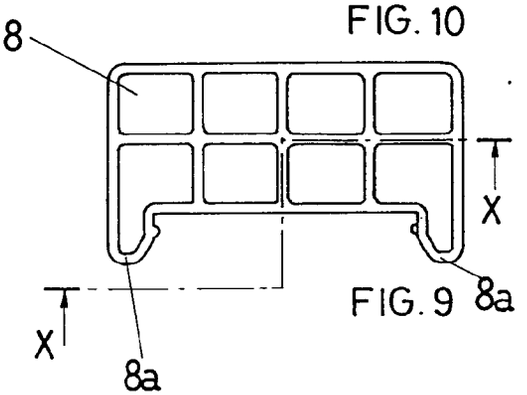


FIG. 9

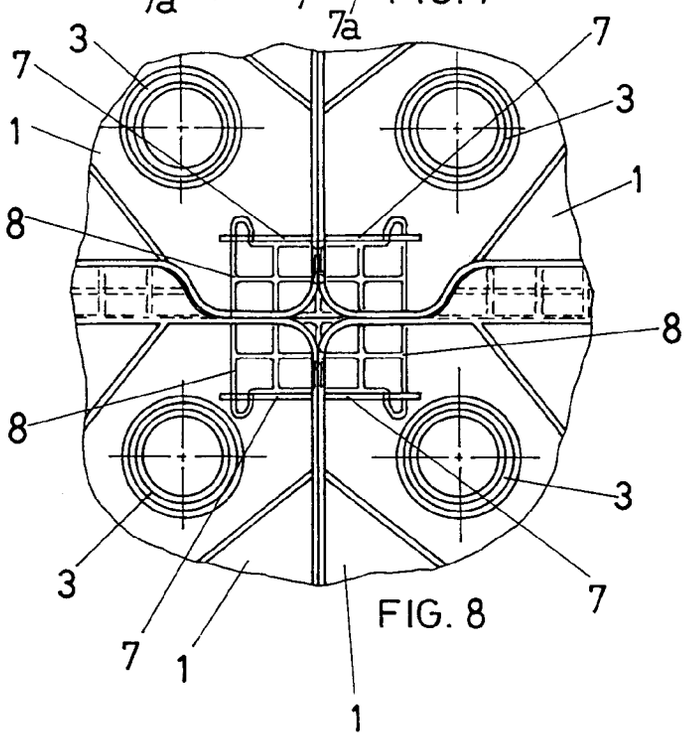


FIG. 8

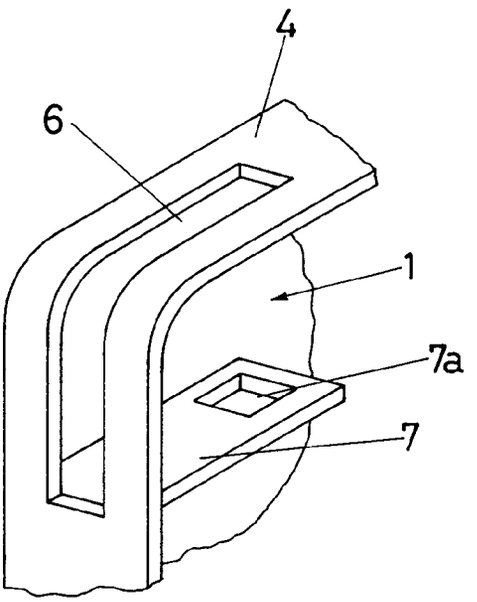


FIG. 5