

United States Patent

[11] 3,550,762

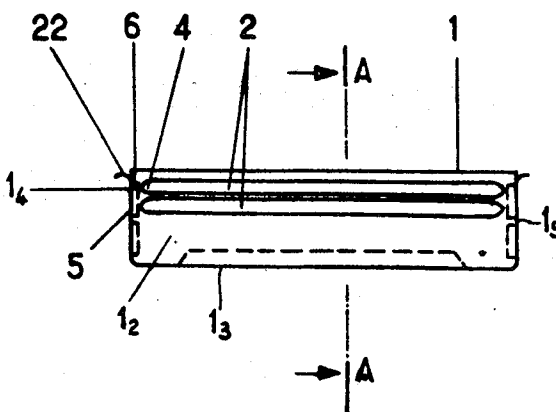
[72] Inventor **Christian Henri José Marie Gau**
Paris, France
 [21] Appl. No. **738,593**
 [22] Filed **June 20, 1968**
 [45] Patented **Dec. 29, 1970**
 [73] Assignee **Service D'Exploitation Industrielle Des**
Tabacs Et Des Allumettes
Paris, France
 [32] Priority **June 30, 1967**
 [33] **France**
 [31] **No. 112554**

[56] **References Cited**
UNITED STATES PATENTS
 1,663,103 3/1928 Thompson..... 206/16X
FOREIGN PATENTS
 1,444,783 5/1966 France 229/9
Primary Examiner—Joseph R. Leclair
Assistant Examiner—John M. Caskie
Attorney—Seidel, Gonda & Goldhammer

[54] **BOX, SPECIFICALLY FOR MATCHES**
12 Claims, 16 Drawing Figs.

[52] U.S. Cl..... **206/20,**
220/41, 229/9
 [51] Int. Cl..... **A24f 27/00**
 [50] Field of Search..... **229/9, 10,**
11, 19, 20; 220/41; 312/348, 330; 206/20

ABSTRACT: The invention relates to a box specifically for matches formed by a drawer and a cover at least partially enveloping the drawer while braking means are provided between the cover and drawer for preventing their inopportune dissociation, the drawer being made from a sheet of plastic and having a central bottom part at a lesser depth than the maximal depth of the drawer, this central bottom part being connected to bottom edges by rigidifying ribs.



SHEET 1 OF 2

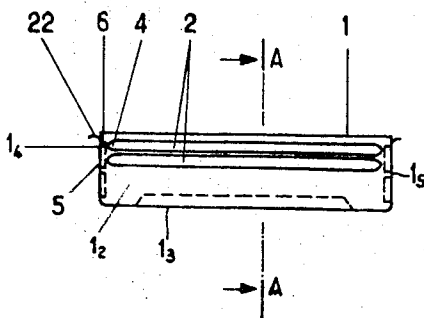


Fig. 1

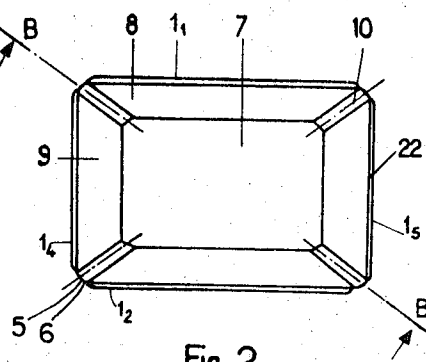


Fig. 2

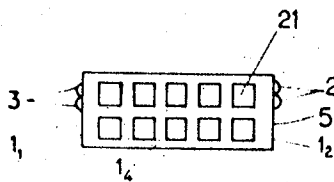


Fig. 3

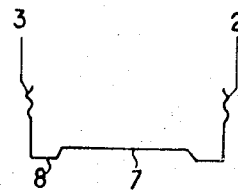


Fig. 4

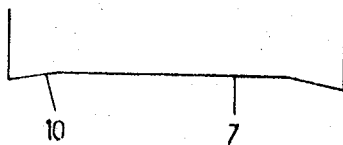


Fig. 5

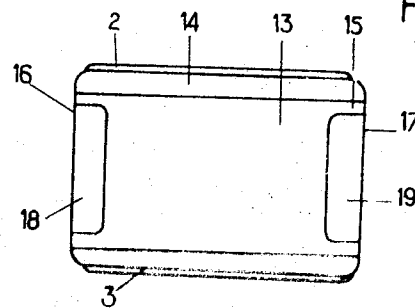


Fig. 6

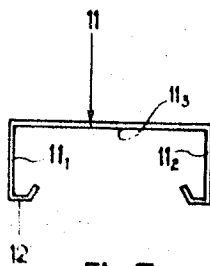


Fig. 7

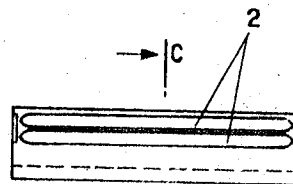


Fig. 8

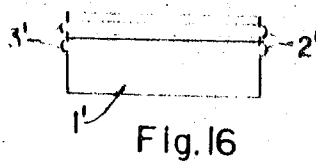


Fig. 16

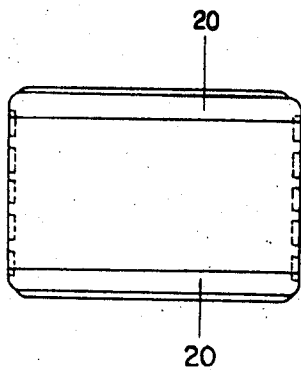


Fig. 9

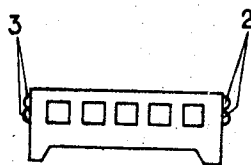


Fig. 10

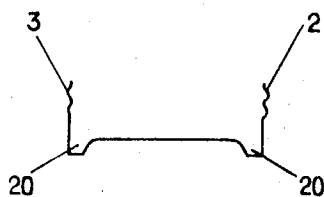


Fig. 11

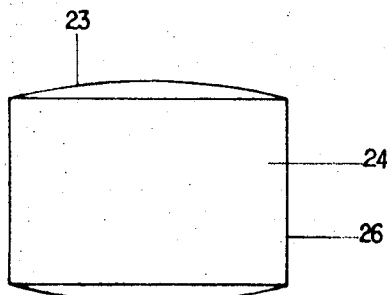


Fig. 12

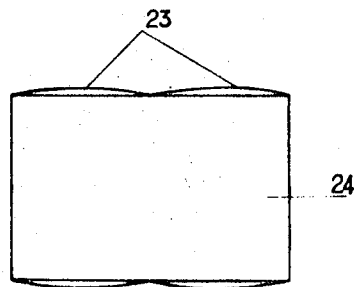


Fig. 13

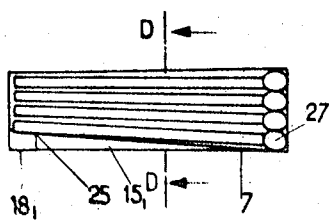


Fig. 14

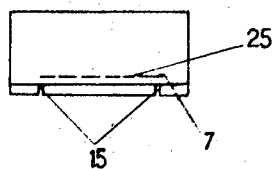


Fig. 15

BOX, SPECIFICALLY FOR MATCHES

Matchboxes are already known whose drawer, devised to slide in a cover, is made of plastic.

The problem is relatively easy to solve by making the plastic walls of a thickness resisting their deformation during handlings.

Specifically, for economic reasons, it is desirable to be able to reduce the thickness of these walls. Nevertheless, a considerable reduction of the latter will necessarily run counter to the necessary rigidity; the drawer, in particular, is crushed during handling, with the consequence of spilling the matches that it contains.

Moreover, smooth materials are not suitable for this purpose. Their surfaces do not have the roughness of the materials generally used, such as wood, which enable the braking of the drawer inside the cover, to prevent the inopportune opening of the box.

In this connection, a solution consists of carefully adjusting the drawer inside the cover. The friction coefficient, when inserting the drawer in the cover, is then such that the risk of deformation increases with the reduction of the thickness of the walls.

Projecting parts have also been provided for. However, these, by forcing the walls, further help deformation and thus increase the disadvantages previously mentioned.

Thus, solutions consisting of providing the bottom of the drawer with longitudinal ribs are not satisfactory. Owing to the general polygonal shape of these boxes, where the bottom of the drawer has a relatively considerable surface, longitudinal ribs must protrude excessively to produce the required braking.

It was ascertained that it was preferable to utilize means whereby braking is obtained by stresses transmitted to the small sides of the cover and on the side walls of the box. The relief of the projecting parts, necessary for producing the same braking effect, can, in this way, be less.

It was furthermore noticed that the best braking that could be obtained without entailing serious deformation of the walls of the box by the ribs was obtained with ribs situated in the relatively distant zones from the upper and lower edges of the walls. In fact, if this condition was not complied with, either the elasticity was neutralized by the necessary rigidity of the bottom and other adjacent walls, or else elasticity was too great on the upper border of the wall. This was distinctly the case, in this latter instance, if the ribbing was connected to the top edge of the wall.

In another field, the making of a matchbox, especially when the drawer is made of deformable thin plastic material, is not without number of problems regarding the necessary rigidity.

On this point, it will be easily perceived that the walls of the drawer, being of very reduced thickness, are subject to multiple deformations in all directions, during handling.

This is one of the essential reasons for which sliding drawer boxes made from a very thin synthetic sheet have not been produced up till now.

Ribs have heretofore been used on drawers of synthetic material, but the purpose of such ribs was to brake the drawer in relation to the cover. Furthermore, this rigidity problem did not arise as the walls of these drawers were relatively thick, thus necessarily increasing the cost price.

The invention relates to boxes, specifically for matches, of which at least the drawer is made from a very thin synthetic sheet.

The present invention thus has the object of a box, specifically for matches, made, on the one hand, of a drawer of polygonal cross section comprising a bottom and lateral sides, on the other hand, a tubular cover arranged so as to at least partially envelope the drawer, braking means being provided between the inner wall of the cover and the outer wall of the drawer, a box characterized in that the drawer, which is made from a sheet of thin deformable synthetic material, has, in its central part at least, a depth less than the maximal height of the lateral sides of the drawer, this maximal height being,

moreover, equal to the corresponding internal dimension of the cover, said central part being also connected to one or more edges of the bottom by one or more rigidifying ribs.

According to one characteristic of the invention, the rigidifying rib extends over the entire periphery of the bottom.

This arrangement makes it easy to put the matches in order and form a housing of larger dimensions for receiving the lighting ends of the matches.

According to another characteristic, the rigidifying rib formed over the periphery of the bottom is discontinuous, the interruption being made by:

- (a) oblique grooves made at the corners of the drawer;
- (b) longitudinal grooves; and
- (c) transverse grooves.

In addition, the longitudinal lateral sides of the drawer comprise braking means formed of at least one longitudinal rib of convex section whose length is less than that of the longitudinal sides.

Rather than by an added element, this longitudinal rib could be more economically made by shaping the actual wall of the drawer or cover.

It will obviously be perceived that the convex section will not necessarily include a curved surface. Thus, the ribs may be defined by planar wall surfaces, intersecting each other at angles.

The external longitudinal ribs are made on the lateral longitudinal walls of the drawer, at a little distance from the upper edge of the latter. These ribs have the advantage of opposing an obstacle to the interlocking of drawers one in the other.

According to this arrangement, such longitudinal ribs will terminate in front of the vertical corners of the drawer, so as to guide the drawer during insertion into its cover. Such an arrangement enables utilization of the flexibility of the lateral wall of the drawer, situated between the ends of the ribs and the corners of the drawer, when the drawer is inserted in this cover.

Preferably, the small sides comprise internal impressions of sufficient size, so as to ensure a certain longitudinal rigidity of the drawer. Such arrangement also forms, in an efficient manner, a new obstacle to the inopportune interlocking of drawers one in the other, during their bulk storage.

A box according to the invention is shown by way of non-restrictive example, in the attached drawings, in which:

FIG. 1 shows a lateral view of the drawer of a matchbox according to the invention;

FIG. 2 is a view from below of FIG. 1;

FIG. 3 is a left-hand view of FIG. 1;

FIG. 4 is a diagrammatical section along the line A-A of FIG. 1;

FIG. 5 is a diagrammatical section, in part, along the line B-B of FIG. 2;

FIG. 6 shows another method of embodiment of the drawer of the box;

FIG. 7 is a method of embodiment of the cover of the box according to the invention;

FIG. 8 shows, in plane, another embodiment of the drawer of the box;

FIG. 9 is an underneath view of FIG. 6;

FIG. 10 is a left-hand view of FIG. 6;

FIG. 11 is a diagrammatical section along the line C-C of FIG. 8;

FIG. 12 and 13 are overhead views of two drawers according to different embodiments of the invention;

FIG. 14 is a section parallel to the longitudinal walls of the drawer showing a false bottom according to a particular embodiment;

FIG. 15 is a section along the line D-D of FIG. 14; and

FIG. 16 is a view similar to FIG. 3, but showing a modified form of the invention.

The matchbox according to the invention consequently consists of a drawer and a cover, the drawer at least being, in the examples given, made from a very thin sheet of synthetic material, and hence, deformable.

The chief advantages of this embodiment lie in its low cost and its sufficient rigidity, in spite of the thin character of the walls, which, by way of example, is about 40/100 mm.

According to the invention, the drawer 1 comprises on its longitudinal lateral walls external projections of any kind. In the example of embodiment of FIGS. 1, 2 and 3 these projections are made in the form of longitudinal ribs 2 and 3. They are intended to ensure the braking of the drawer inside the corresponding cover 11 and to increase the rigidity of this drawer. These ribs are either continuous or discontinuous.

The dimensions of the drawer and ribs are such that the inner width of the cover 11 is comprised between the width of the drawer at the base of the ribs and the width of the drawer including these ribs.

In the example of embodiment shown in FIGS. 1, 2 and 3, the drawer comprises, on each of its longitudinal walls 1₁ and 1₂, two ribs 2 or 3, these longitudinal ribs being placed in the upper half of said walls 1₁ and 1₂.

Moreover, the ends of the ribs 2 and 3 stop at a short distance from the vertical corners 5 of the drawer so as to leave a space 6 without rib between said ends and corners 5.

Thus, this space 6 enables, on the one hand, the guiding of the drawer, when it is inserted in the cover 11, and on the other, utilization of the flexibility of the lateral wall at the height of this space 6, to enable the ribs 2 and 3 and walls 1₁ and 1₂ to flex. Slightly into the interior of the drawer when penetrating into the cover to produce braking by means of the ribs pressing on the internal lateral walls 11₁ and 11₂ of the cover.

Also, the ribs 2 and 3, are surrounded on all sides, by a non-ribbed lateral wall so as to be able to utilize the flexibility of this wall over the whole length of the ribs.

The ribs 2 and 3 are provided here in the upper half of the wall. This arrangement has a particular interest. It is determined, taking the material used into account, so as to effect a compromise between elasticity and deformation. This deformation results, on the one hand, from the position of the ribs 2 or 3 in relation to the lower edge 1₃ of the wall, of the height of the ribs in relation to the plane of the wall. The more their distance in relation to the above-mentioned edge is great, the more it is necessary to increase the height of said ribs for obtaining one and the same elastic resistance; in these conditions, the deformation of the wall is considerable. It is thus desirable to reduce the distance between the ribs 2 or 3 and the lower edge 1₃ of the wall, to an extent favorable to a moderate elastic resistance without setting up excessive thrusts on the other parts forming the box.

Of course, the ribs 2 and 3 can be either continuous or discontinuous; they can, for instance, be situated in the vicinity of the ends of the lateral longitudinal walls.

At least one of the transverse lateral walls 1₁ of the drawer comprises projections 21, in hollow or in relief, of any shape made, for instance, in the form of impressions sufficient to increase the longitudinal rigidity of the drawer and avoid the possibility of interlocking two drawers during handling.

The projections 21 can also be made in the shape of ribs eventually forming of extensions of the ribs 2 and 3 provided on the lateral longitudinal walls 1₁ and 1₂. In this latter case, the ribs are annular, as in FIG. 16.

Moreover, the top edge of the lateral transversal walls 1₄ and 1₅ comprises a turned over edge 22 intended to avoid the hooking of this top edge on the inner face 11₃ of the upper wall of the cover 11.

Also, the bottom of the drawer 1 is made in a particular manner, so as to facilitate the fitting of the matches and increase its rigidity.

As can be seen in FIGS. 1, 2 and 4, the drawer comprises a central part 7, of generally rectangular shape, which is raised in relation to the peripheral part 8 which comprises a rigidifying rib. This rib has the effect of increasing the rigidity of the drawer assembly and also forms a housing, for instance, at the end 9, for receiving the ends 27 of the matches according to the side of their button.

Actually, the matches have an extra thickness at their striking end, so that by use of the central part 7, which forms in effect a false bottom, I increase the rigidity of the drawer without reducing its capacity, while facilitating the inserting of the matches.

According to the invention, roughnesses may be provided on the periphery of the bottom, so as to increase the braking of the drawer in the cover; the roughnesses are preferably made by inscriptions, such as publicity inscriptions.

The central part 7 is connected to the corners of the drawer by grooves, 10, whose depth increases from the corners of this drawer up to the central bottom, this arrangement still further increasing the rigidity of the drawer solely on account of these grooves 10 made in diagonals.

According to the invention, it has also been provided to make the cover of the matchbox also of plastic; a method of embodiment of this cover is shown in FIG. 7.

In this case, the cover is not closed as usual, but consists of a section of generally U-shape easily made, the U having at the end of its two arms a double turning back 12 so as to form longitudinal hooks engaging on the rib 8, peripheral or otherwise, bordering the central bottom 7 of the drawer.

In the case of a cover made in the manner shown in FIG. 7, the drawer can be made as shown in FIG. 6.

In this case, the central bottom 13 is bordered by ribs 14 which comprise longitudinal grooves 15 uniting this central bottom 13 to the transverse walls 16 and 17.

In this case, the grooves 15 can have a regular depth.

It will be noted that the presence of the grooves 15 does not prevent the presence of the grooves 10 (FIG. 2) arranged obliquely.

It is also possible in the case of FIG. 6 to eliminate the end 18 and 19 transverse ribs, in order to obtain a drawer like that shown in FIGS. 8 to 11.

Actually, in this case, the drawer also has longitudinal ribs 2 and 3, provided on the lateral longitudinal walls 1₁ and 1₂, whereas the bottom only comprises two ribs 20 forming two guide rails parallel to the longitudinal edges of the bottom.

Obviously, these hooks 12 of the cover 11 are of similar shape to these rails 20 and are, for instance, of trapezoidal shape.

In the case of FIG. 12, the ribs obtained by the convexity of the walls 23 are bowed outwardly. To avoid too considerable a deformation of the bottom wall 24 and lateral transversal walls 26, the solution shown in FIG. 13 can be particularly advantageous. The double convexity has the effect of producing a tightening of suitable value, whether the drawer is totally or partially inserted in the cover.

The latter solution also has the advantage of reducing the effective volume of the drawer and compensates, in this way, for the increase of volume resulting from replacing wood or other material previously used for making drawers, by a material of much less thickness.

This also applies to the ribs 20 made in the actual hollow of the central bottom 7.

Furthermore, this central bottom 7 has, in the embodiment of FIGS. 14 and 15, the additional advantage of a classifying of the matches so that their top layer is in a plane parallel to the plane passing through the upper edges of the lateral sides of the drawer. In this way, the extra thickness of the heads 27 is compensated for.

According to this embodiment, a bottom is provided made of a transverse border 18, connected to the central bottom 7 by a corner 25, and framed by two longitudinal grooves 15. FIG. 15 shows the grooves 15, intended to act as guide rails for the cover 11 of corresponding shape (shown in FIG. 7).

The plastic drawers can be easily made by heat-shaping by submitting a thin sheet of plastic, progressively heated to the requisite temperature for its deformation, and by submitting this sheet to a forming-cutting unit fitted with a mold responding to the shapes sought.

In the forming-cutting unit, the sheet is gripped during the closing of the mold, then a punch, called "forming" operated

by a jack is lowered into the mold to effect proper distribution of the plastic material in the impression; during this operation a compressed air jet is blown into the impression to compel the still soft plastic material to line the walls.

It is only at the end of this operation that cutting takes place under the action of the rise of the mobile plate of the unit. During the opening of the forming-cutting unit, a member ejects the drawers thus obtained.

Also, the cover shown in FIG. 7 can be obtained in a very simple manner by rolling, utilizing a strip of plastic material which is progressively folded by means of rollers.

I claim:

1. A box for matches or the like comprising a drawer of deformable sheet plastic polymeric material, said drawer having a polygonal cross section comprising a bottom and lateral sides coupled to lateral edges of said bottom, and transverse sides coupled to said lateral sides and edges of said bottom, said bottom including at least a central portion displaced upwardly from the plane of the remainder of said bottom and defining a portion of said drawer having a depth less than the height of said lateral sides, rigidifying ribbing in said bottom disposed between said central portion and a lateral edge of said bottom, a tubular cover adapted to at least partially envelope said drawer, said cover having an internal dimension corresponding to the maximum height of said lateral sides, and braking means disposed between an inner surface of said cover and an outer surface of said drawer to frictionally interconnect said cover and said drawer.

2. A box in accordance with claim 1, wherein said rigidifying ribbing comprises ribs extending over the entire periphery of said bottom.

3. A box in accordance with claim 1, wherein said rigidifying ribbing comprises a plurality of oblique grooves at the corners of said drawer, a plurality of grooves extending longitudinally of said drawer, and a plurality of grooves extending

transversely of said drawer.

4. A box in accordance with claim 1, wherein said rigidifying ribbing extends on three edges of said bottom, said central portion being slanted so as to be flush with the corner of the drawer where there is no ribbing.

5. A box in accordance with claim 1, wherein the transverse sides of said drawer include inwardly directed hollow impressions.

6. A box in accordance with claim 1, wherein said central portion of said bottom is coupled to said lateral and transverse sides by a portion of said bottom extending at an obtuse angle with respect to said central portion.

7. A box in accordance with claim 1 wherein said central portion of said bottom is connected to said lateral and transverse walls by a curved radius portion.

8. A box in accordance with claim 1 wherein said cover is generally U-shaped in cross section, and includes downwardly extending arm portions and inwardly directed hook portions disposed at distal ends of said arm portions adapted to hook onto said rigidifying ribbing so that said ribbing acts as a guide for said hook portions.

9. A box in accordance with claim 1, wherein said braking means comprise longitudinally extending convex rib means disposed on said lateral sides, said rib means extending for a length less than that of the lateral sides.

10. A box in accordance with claim 9, said rib means comprising two parallel ribs on each lateral side, one of said ribs on each lateral side being disposed at about halfway up the side.

11. A box in accordance with claim 9, wherein said ribs have a rounded cross section throughout their length.

12. A box in accordance with claim 9, wherein said ribs comprise a plurality of successive longitudinally extending convexities.

40

45

50

55

60

65

70

75