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(54) **PAPER PROTECTION ELEMENT FOR A PLATE BODY, IN PARTICULAR A DOOR LEAF, AND BLANK FOR MANUFACTURING THIS PAPER ELEMENT**

(57) A door leaf (1) is protected by means of a packing (2) having, for each corner (7) of the leaf (1), a respective paper protection element (10), which delimits an outward open cavity (8) for the insertion of a peripheral corner portion (P) of the leaf (1) and has two flat side walls (11), which face and are parallel to one another, a bottom wall (12), which is connected to the side walls (11) in an integral manner, and a base wall (13); the base wall (13) being connected to the side walls (11) and to the bottom wall (12) and being a quadrangular tubular wall reinforced with diagonal reinforcements (22).

FIG. 2

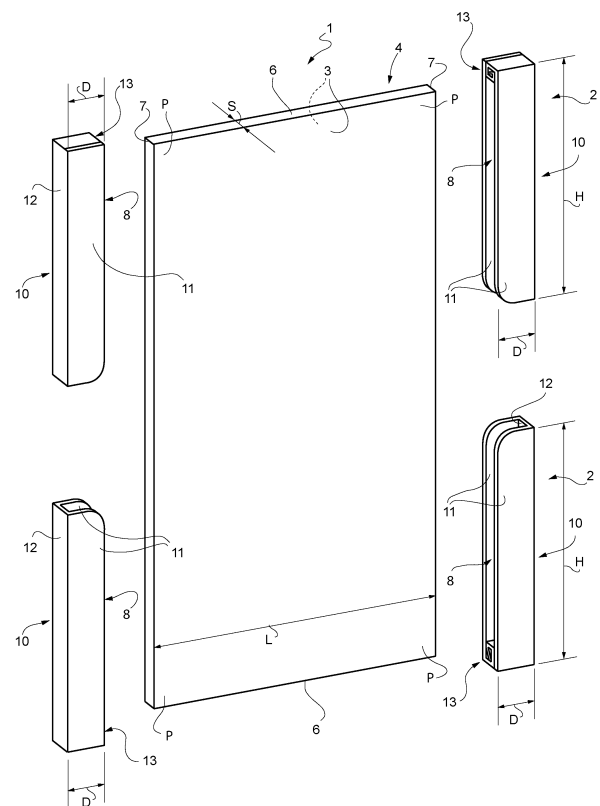
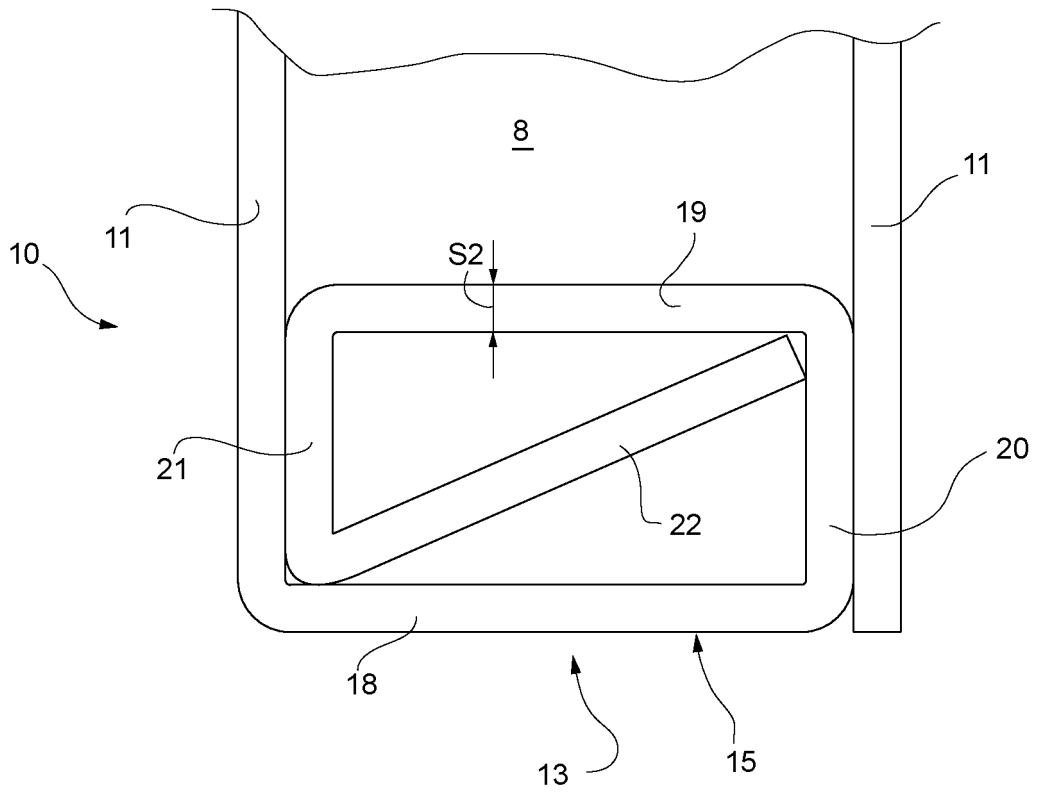


FIG. 4



Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This Patent Application claims priority from Italian Patent Application No. 10202000032240 filed on December 23, 2020.

TECHNICAL FIELD

[0002] The invention relates to a paper protection element for a plate body.

[0003] In particular, the invention relates to a paper protection element, which finds advantageous, though non-exclusive, application in the packing of a door leaf, to which explicit reference will be made in the description below without because of this losing in generality.

BACKGROUND ART

[0004] As it is known, in order to preserve the integrity of a door leaf during the manipulation, transport and handling thereof from and to stores and warehouses, the leaf itself is protected with dedicated packings, which are configured as a function of the size or shape features of the leaf.

[0005] According to a first packing solution, the packing is obtained by placing the entire leaf inside a closed paper case or container. This type of packing, even though, on the one hand, it protects the leaf from accidental hits, is not capable of protecting it in case the leaf accidentally falls sideways or is laid down without paying attention. The consequence is that the leaf always has one or more dented corners or ruined or damaged peripheral edges.

[0006] According to a different packing solution, the leaf is packed by means of plastic or synthetic covers, which are or are not reinforced in the area of the corners with synthetic inserts, for example made of polystyrene.

[0007] These packings, despite being used because they offer an improved protection compared to the paper packings described above, suffer from the main drawback of being relatively expensive from a manufacturing point of view, since they require the use of dedicated apparatuses.

[0008] In addition, plastic packings comprise a plurality of single parts that have to be singularly moved and put in position both when the packing is built and assembled and when the packing has to be removed for the following installation of the leaf.

[0009] Finally, after having been removed, plastic packings become a source of pollution and, therefore, need to be disposed of with specific procedures and with costs that are far from insignificant.

DISCLOSURE OF INVENTION

[0010] The object of the invention is to provide a paper protection element, which can solve the problems dis-

cussed above in a simple and cost-effective fashion.

[0011] In particular, the object of the invention is to provide a paper protection element, which can easily and quickly be applied on the leaf and can also easily be removed from the leaf, which ensures a high degree of protection and which has both small manufacturing costs and small disposal costs.

[0012] According to the invention, there is provided a paper protection element for a plate body, in particular a door leaf, as claimed in claim 1.

[0013] The invention further relates to a flat paper blank.

[0014] According to the invention, there is provided a flat paper blank for manufacturing a protection element as claimed in claim 4.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention will now be described with reference to the accompanying drawings, which show a non-limiting embodiment thereof, wherein:

figure 1 shows, in a perspective view, a leaf of a door packed with a preferred embodiment of a paper protection element according to the invention;
figure 2 is an exploded perspective view of the packed leaf of figure 1;
figure 3 is an enlarged perspective view of a terminal portion of the paper protection element of figure 2;
figure 4 is a front view, on a larger scale, of the terminal portion of figure 3; and
figure 5 shows, in plan view and on a larger scale, a flat paper blank for manufacturing the protection element of figures 1 and 2.

BEST MODE FOR CARRYING OUT THE INVENTION

[0016] In figure 1, number 1 indicates a leaf packed by means of a protection packing 2.

[0017] The leaf 1 has a thickness S and is delimited, frontally, by two opposite wide surfaces 3 and, laterally or peripherally, by two opposite vertical surfaces 5 and by two opposite horizontal surfaces 6, which are joined in respective corners 7.

[0018] The packing 2 comprises, for each corner 7, a respective protection element or body 10, which is distinct and separate from the other protection elements 10 and defines an outward open cavity 8 configured to accommodate a relative corner portion P of the leaf 1 (figure 2).

[0019] Conveniently, each protection body 10 is manufactured as one single piece of paper material.

[0020] With reference to figures 2 to 4, each protection body 10 is a box-shaped body, which has an insertion opening for the relative corner portion P of the leaf 1 and comprises to flat side walls 11 facing one another, which are spaced apart from one another by an amount that is equal to or rounded down to the thickness S of the leaf

1, so as to each strike against a relative wide surface 3 (figure 1).

[0021] Each side wall 11 has a thickness S1, which is smaller than the thickness S, a height H and a size D, which is much smaller than the width L of the door 1, so as to only cover a peripheral portion of the wide surface 3 and leave an intermediate part of the wide surface 3 uncovered.

[0022] Each protection body 10 further comprises a bottom wall 12 or back, which is also flat, is firmly connected to the side walls 11 and extends orthogonally to the side wall 11 and against which a respective vertical surface 5 strikes.

[0023] With specific reference to figures 3 and 4, each protection body 10 further comprises a damping base wall 13, which extends between the side walls 11 over the entire length of the side walls 11 and defines a support for the respective surface 6.

[0024] Always with reference to figures 3 and 4, the base wall 13 is firmly connected to the walls 11 and comprises a tubular portion 15, which has, in a section orthogonal to the side walls 11, a rectangular annular shape.

[0025] The tubular shape 15 has a constant thickness S2. Conveniently, the thickness S2 is equal to the thickness S1 of the side walls 11 and of the bottom wall 12.

[0026] With reference to figures 3 and 4, again, the tubular portion 15 comprises an outer wall 18, an inner wall 19 and two upright walls 20 and 21, which are integral to the walls 18 and 19.

[0027] Conveniently, the inner wall 19 faces and has the same dimensions as the outer wall 18 and defines a support abutment for the relative surface 6 of the leaf 1.

[0028] Conveniently, furthermore, the upright walls 20, 21 face one another and are identical to one another from the point of view of geometry and dimensions.

[0029] With reference to figures 3 and 4, again, the base wall 13 finally comprises a diagonal reinforcement wall 22 reinforcing the tubular portion 15 and extending along a diagonal of the tubular portion 15.

[0030] Conveniently, though not necessarily, each protection body 10 is manufactured starting from a flat blank 25 with weakened portions, each defining a respective folding line as shown in figure 5.

[0031] With reference to figure 5, the flat blank 25 is manufactured as one single piece of paper material, has a thickness that is equal to the thicknesses S1 and S2 and comprises rectangular plate bodies, indicated with 26 and 27.

[0032] The plate body 26 has a larger side 26', which is equal to the height H, and two weakening lines 28 and 29, which are parallel to one another, to the larger side 26' and to the larger side 27' of the rectangular portion 27.

[0033] The weakening lines 28 and 29 divide the plate body 26 into three rectangular portions, namely two side portions, indicated with 30 and 31, which are equal to one another and each have a geometry and an extension that are equal to the ones of the side walls 11, and a

central portion 32, which has a geometry and an extension that are equal to the ones of the bottom wall 12.

[0034] The plate body 27 extends in a projecting manner from a smaller side of the side portion 30 and has a smaller side whose length is smaller than and is rounded down relative to the length of the smaller side of the side portion 30 (figure 5). The plate bodies 26 and 27 are connected to one another along a weakening line 33.

[0035] The plate body 27 has, in turn, four weakening lines 34, 35, 36 and 37, which are parallel to the line 33 and orthogonal to the lines 28 and 29. The lines 34-37 divide the plate body into five portions, indicated with 38, 39, 40, 41 and 42.

[0036] The portions 38, 39, 40, 41 and 42 have a geometry and dimensions that are basically equal to the geometry and the dimensions of the wall 18 and of the walls 20, 19, 21 and 22, respectively.

[0037] With reference to figure 5, again, along the weakening line 34 there is obtained a through slit 44 or cut, which is configured to be crossed by a retention tab 45 projecting from the smaller side of the portion 31.

[0038] Starting from the blank 25, the protection body 10 is obtained by forming, at first, the bottom wall 13 by rotating, starting from the portion 42, the portions 38-42 in a counterclockwise direction around the relative weakening lines 34-37, thus forming the tubular portion 15, and by placing the portion 42 in a diagonal position inside the tubular portion 15, causing a free terminal end of its to strike against an inner corner of the tubular body 15, as shown in figure 4. After that, the formed tubular portion 15 is rotated around the line 33 in a clockwise direction relative to the portion 30 and the portion 30 is rotated around the line 28 until it is arranged orthogonally to the portion 32. At this point, the portion 31 is folded along the line 29 and locked to the structure 15 by inserting the tab 45 into the slit 44, thus completing the relative protection body 10, which, hence, is ready to be fitted onto the leaf 1.

[0039] Owing to the above, it is evident that, in case of a sideways fall, each corner 7 of the leaf 1 is protected by the relative protection body 10, whose base wall 13, due to the fact that it has a tubular structure, on the one hand, and, in particular, a tubular structure reinforced by elastic diagonal reinforcements defined by the diagonal wall 22, on the other hand, acts like an elastic damping body, preserving, by so doing, the relative corner 7.

[0040] The side walls 11 and the bottom wall 12, on the other hand, protect the longitudinal side edges where the surfaces 3, 5 and 6 are joined against accidental hits.

[0041] Since each protection body 10 is exclusively made of paper material, it is biodegradable and, hence, can easily be disposed of. The disposal and, in general, the removal are made easier by the fact that the protection bodies 10 used for the packing of the leaf 1 are separate from and independent of one another.

[0042] Even though the protection bodies 10 have small dimensions and, therefore, leave a large area of the leaf 2 uncovered, they define anyway a constructively

simple, but effective packing 2.

[0043] Besides, when they are obtained starting from the flat blank 25, the manufacturing of the protection bodies 10 is simple, immediate and intuitive and does not require the use of gluing materials or plastic or metal joining points, which would make the disposal more complicated. Indeed, the different parts of the blank 25 are firmly connected to one another in the area of the weakening lines and by means of one single tab, which is inserted into one single retention slit.

[0044] Because of how they are manufactured and, in particular, since the base wall 13 is arranged between the side walls 11, the protection bodies 10 have an extremely stable shape in case of hits, even violent ones, such as a free fall of the leaf 1.

[0045] Owing to the above, it is evident that protection 2 described herein could be subjected to changes and variants, without for this reason going beyond the scope of protection set forth in the claims.

[0046] In particular, the protection bodies 10 could still be made of a paper material, but consist of several single parts connected to one another by means of interlocking or gluing.

[0047] Furthermore, the protection bodies 10 could have geometries or dimensions that are different from the ones indicated above by way of example.

[0048] Finally, the protection bodies 10 described above could be used for the protection of plate bodies of any type, such as for example slabs or plates in general, which, like door leaves, need to be protected in case of hits.

Claims

1. A paper protection element for a plate body, in particular a door leaf, the paper element delimiting an outwardly open cavity for inserting a peripheral corner portion of the plate body, the paper element comprising two flat side walls facing and parallel to one another, a bottom wall integrally connected to the side walls and a base wall; the base wall being a reinforced tubular wall; **characterised in that** said reinforced tubular wall comprises a monolithic tubular portion having a quadrangular cross section with a constant thickness, and **in that** said reinforced tubular wall further comprises an upright extending along a diagonal of said tubular portion and having a free terminal end arranged so as to strike against an inner corner of the side wall.
2. The element according to claim 1, **characterised in that** said reinforced tubular wall extends between said side walls
3. The element according to claim 1, **characterised in that** said upright is defined by a flat wall.

4. A flat paper blank for manufacturing a paper protection element, as claimed in claim 1, the blank being manufactured in one single piece and comprising a first and a second rectangular plate body joined together along a weakening line; the first plate body having first weakening lines delimiting first portions defining the side and bottom walls, and the second plate body having second weakening lines delimiting respective second portions defining the base wall; said second plate body has four second weakening lines parallel to said weakening line arranged between said two plate bodies and orthogonal to said first weakening lines and comprising a projecting terminal portion defining the upright.
5. The blank according to claim 4, **characterised in that** said first plate body has two first weakening lines parallel to one another and to the larger sides of said first and second rectangular portions; said first two weakening lines dividing the first plate body into three first portions, two being side portions each having a geometry and an extension and a thickness equal to that of the side walls, and a central portion having a geometry, an extension and a thickness equal to the bottom wall.
6. The blank according to claim 5, **characterised in that** said second plate body extends in a cantilever fashion from a smaller side of one of said first side portions of said first plate body.
7. The blank according to claim 4, **characterised in that** a through cut or slit is made along one of said second weakening lines, and **in that** one of said first side portions of said first plate body carries a retention tab protruding in a cantilever fashion from the smaller side of said first side portion and configured to be force fitted through said through cut.

FIG. 1

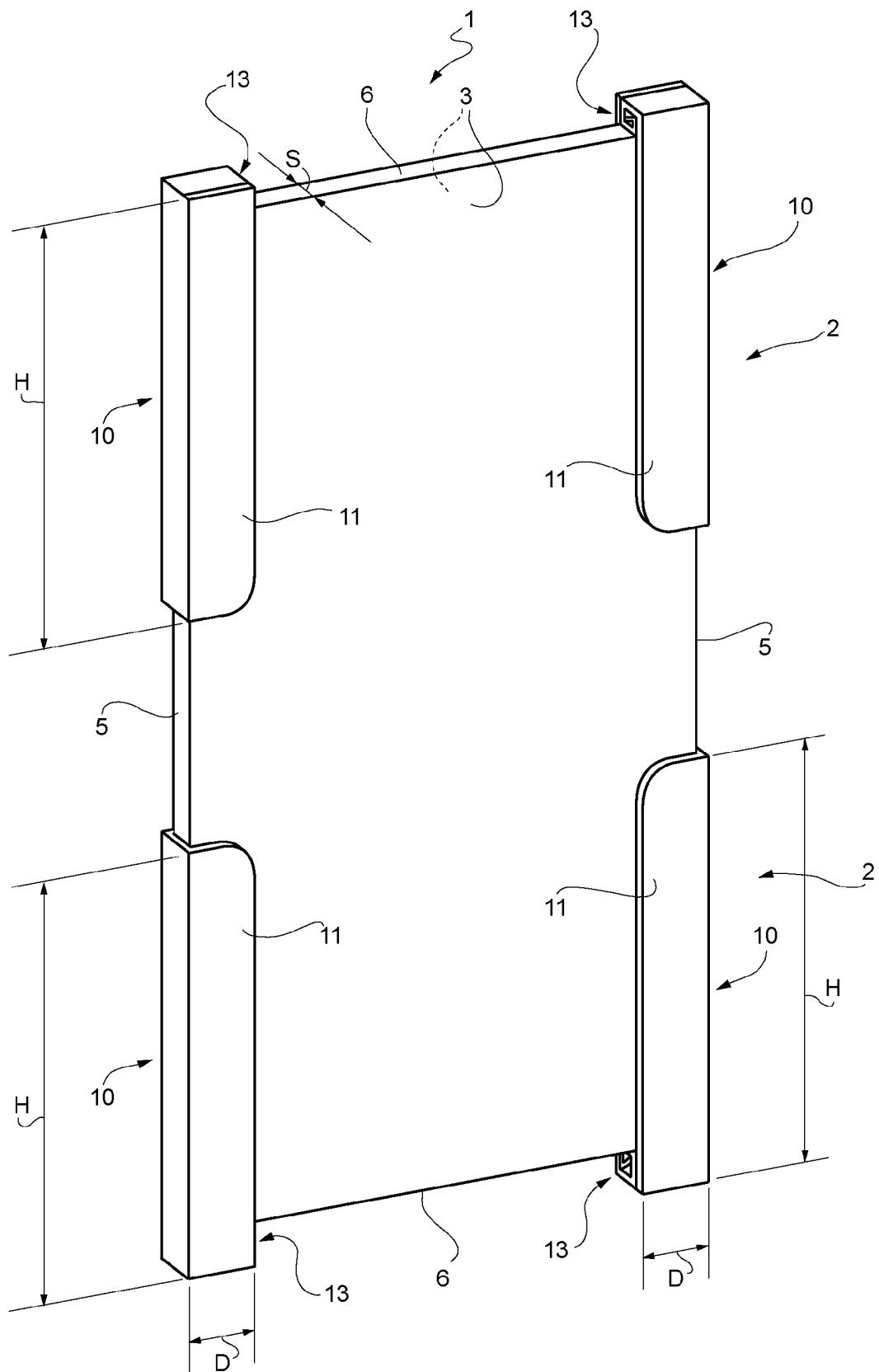


FIG. 2

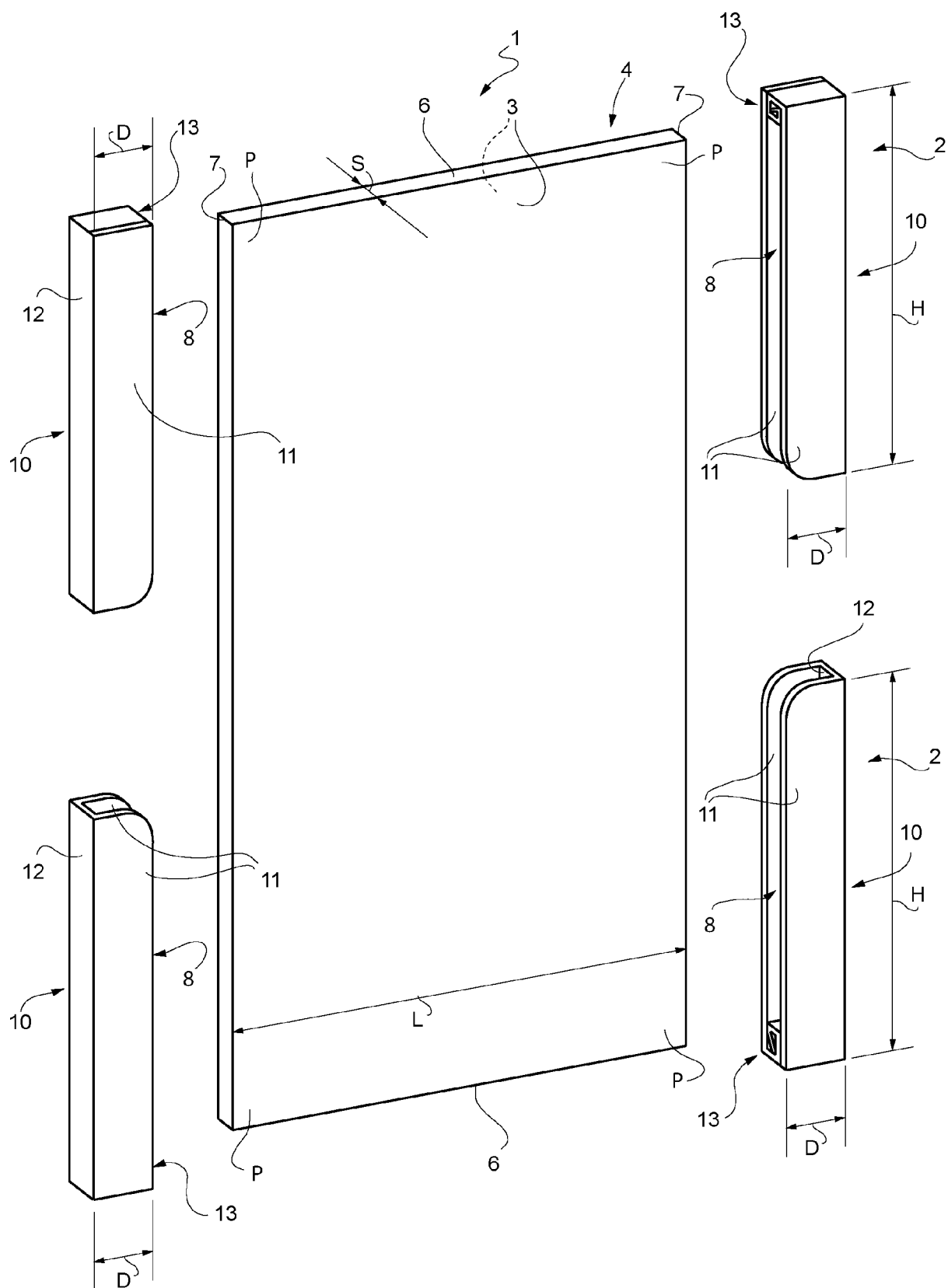


FIG. 3

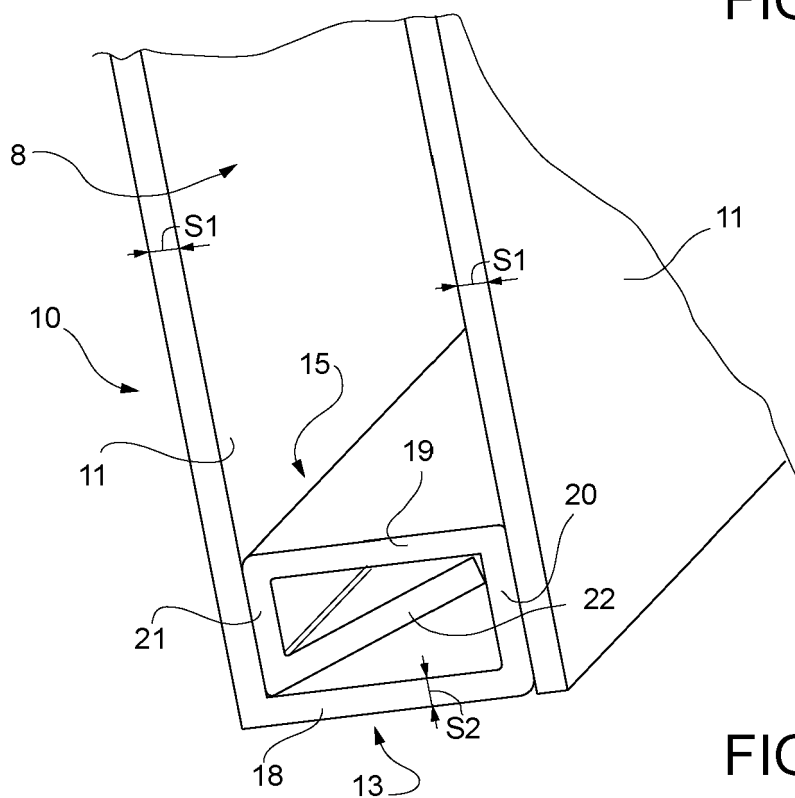


FIG. 4

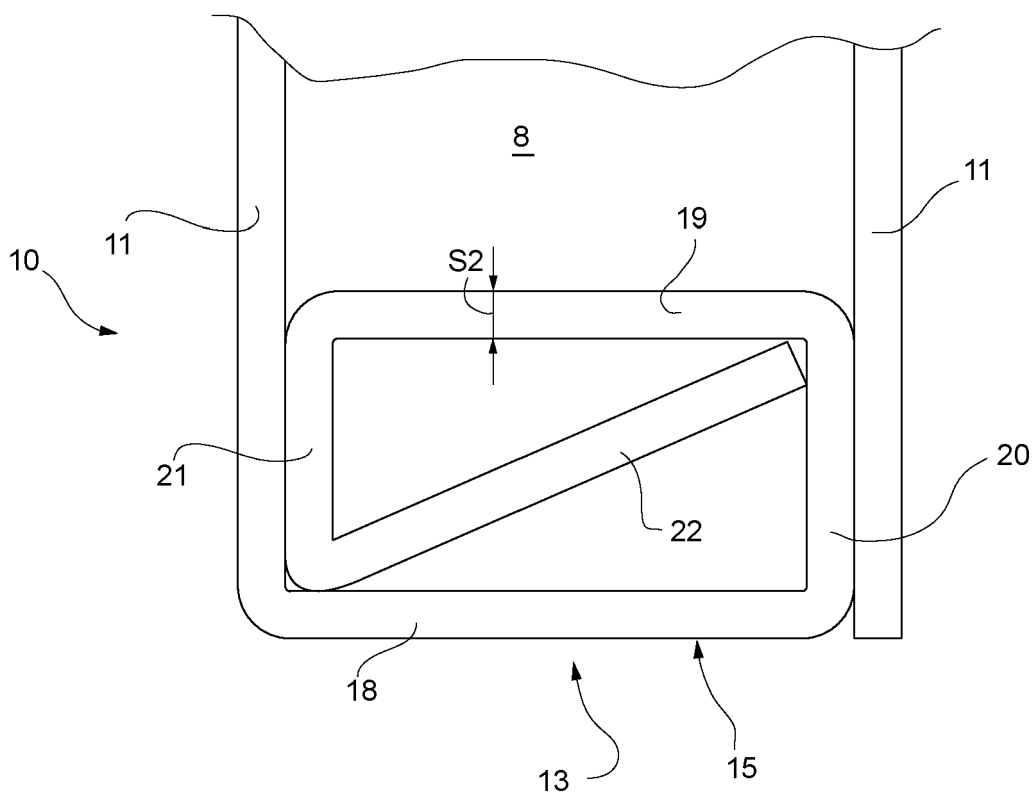
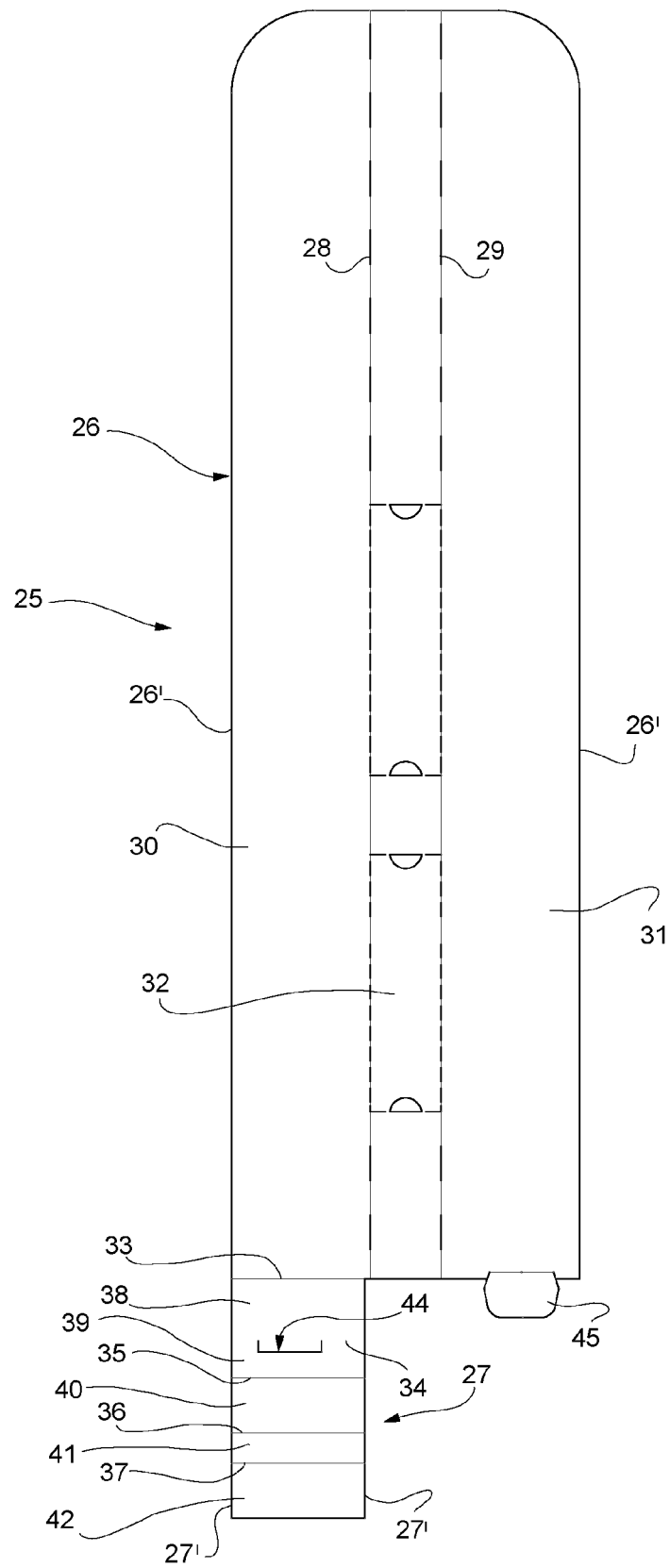


FIG. 5





EUROPEAN SEARCH REPORT

Application Number

EP 21 21 7459

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EPO FORM 1503 03.82 (P04C01)

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 29 April 2022	Examiner Grondin, David
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ON EUROPEAN PATENT APPLICATION NO.**

EP 21 21 7459

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29-04-2022

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