(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 668 045 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
25.03.2015 Bulletin 2015/13

(21) Application number: **12707911.9**

(22) Date of filing: **26.01.2012**

(51) Int Cl.:
B42B 5/10 *(2006.01)*

(86) International application number:
PCT/IB2012/050374

(87) International publication number:
WO 2012/101600 (02.08.2012 Gazette 2012/31)

(54) **METHOD AND DEVICE FOR MANUALLY BINDING A BUNDLE OF SHEETS**

VERFAHREN UND APPARAT ZUM MANUELLEN BINDEN EINES BLATTSTAPELS

PROCÉDÉ ET DISPOSITIF POUR RELIER MANUELLEMENT UN PAQUET DE FEUILLES

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **26.01.2011 IT TO20110068**

(43) Date of publication of application:
04.12.2013 Bulletin 2013/49

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EP 2 668 045 B1

Printed by Jouve, 75001 PARIS (FR)

Description

TECHNICAL FIELD

[0001] The present invention relates to a method and device for manually binding a bundle of sheets.

BACKGROUND ART

[0002] As is known, bundles of sheets are bound manually in various ways, e.g. by applying an adhesive strip to one edge of the bundle; or inserting a spiral through holes punched beforehand in the sheets; or applying a ring binder formed by folding a plastic strip into a C about one edge of the bundle, inserting a number of teeth, integral with the strip, inside respective holes punched beforehand in the sheets, and looping each tooth through the respective hole.

[0003] Though widely used, the above methods have serious drawbacks: the binding obtained by using adhesive strips is weak, and spirals and ring binders increase the thickness of the bound edge, making it difficult to stack the bundles.

[0004] Moreover, to recycle the bundles, plastic spirals and ring binders must first be removed, which is not always an easy job.

[0005] The above problems are normally solved using a paper binder, which is applied to one edge of the bundle, in which holes are punched beforehand, to form an outer spine substantially adhering to the edge.

[0006] More specifically, the paper binder is normally comb-shaped, and comprises a strip of paper having an adhesive portion on one face, and a number of teeth equally spaced along its longitudinal edge.

[0007] The bundle is bound by inserting the teeth through the holes in the sheets; folding the strip into a U about and onto the edge of the bundle, so the adhesive portion of the strip at least overlaps the free ends of the teeth projecting from the holes; and sticking the adhesive portion onto the opposite side of the bundle to that in which the teeth are inserted, so as to loop each tooth firmly through the respective hole and secure the strip firmly to the bundle.

[0008] A paper binder of this type is described, for example, in WO 00/40426 and WO 00/24592.

[0009] Binding as descried above is still performed using devices which, though efficient, are extremely complicated mechanically and in design, and therefore fairly expensive to produce and maintain.

DISCLOSURE OF INVENTION

[0010] It is an object of the present invention to provide a method and device for manually binding a bundle of sheets, and designed to provide a simple, low-cost solution to the above drawbacks.

[0011] According to the present invention, there are provided a method and device for manually binding a bundle of sheets, as claimed in the accompanying Claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which :

Figure 1 shows a view in perspective of a preferred embodiment of the binding device according to the present invention;

Figure 2 shows the Figure 1 device in a different operating configuration;

Figure 3 shows, with parts removed for clarity, a paper binder usable on the Figure 1 device;

Figures 4 to 7 show larger-scale cross sections of a detail in Figure 1 in respective different operating configurations;

Figure 8 shows a variation of the Figure 1 binding device;

Figures 9 to 13 show cross sections of the Figure 8 device in respective different operating configurations.

BEST MODE FOR CARRYING OUT THE INVENTION

[0013] Number 1 in Figure 1 indicates as a whole a device for manually binding a bundle 2 of rectangular sheets, each having a number of rectangular through holes 3 (Figures 4-7) equally spaced along a straight long side 4 of bundle 2 and aligned transversely with the corresponding holes 3 in the other sheets.

[0014] To bind bundle 2, device 1 employs a known binder, which is folded, as described below, about side 4, and is defined, as shown in Figure 3, by a strip 5 made of paper or other flexible material, and comprising a rectangular portion 6, and a number of teeth 7 integral and coplanar with rectangular portion 6 and equally spaced 'comb-fashion' along a straight long edge 8 of rectangular portion 6. Teeth 7 are preferably formed integral with rectangular portion 6, and each have a rounded free end portion 9.

[0015] One face 10 of rectangular portion 6 is coated entirely with a thin coating of adhesive, preferably cold-stick glue, with the exception of a rectangular non-stick area 11, which extends parallel to and along the whole length of edge 8, and defines, on face 10, a first adhesive area 12 extending from non-stick area 11 to edge 8, and a second adhesive area 13 wider than adhesive area 12 and extending from non-stick area 11 to the free edge of rectangular portion 6 opposite edge 8. A removable film is normally applied to face 10 to protect adhesive areas 12 and 13.

[0016] On the opposite face to face 10, rectangular portion 6 has a rib extending parallel to edge 8, between adhesive area 12 and non-stick area 11, and defining a fold line 6a (shown by the dash line in Figure 3) on rec-

tangular portion 6.

[0017] As shown in the attached drawings, device 1 comprises a support 14 in turn comprising a pocket 15 for housing a loose bundle 2. Pocket 15 comprises a rectangular inner wall 16; a rectangular outer wall 17 facing inner wall 16; and an end wall 18 crosswise and hinged to inner and outer walls 16 and 17, so pocket 15 can be opened book-fashion by the user to insert bundle 2 easily inside.

[0018] Preferably, pocket 15 is made of cardboard or plastic, and end wall 18 is formed, e.g. punched, integrally with walls 16 and 17, and connected to them by thin portions of material defining respective virtual hinges. In a variation not shown, end wall 18 is integral with inner wall 16 and only hinged to outer wall 17.

[0019] Opposite the end connected to end wall 18, inner wall 16 has an end portion which projects beyond outer wall 17, is bounded by a straight edge 19 parallel to end wall 18, and is fitted with an articulated appendage 16a of inner wall 16. More specifically, as shown in Figures 4 to 7, articulated appendage 16a forms part of support 14, and comprises a rib 20 extending outwards of, parallel to, and along the whole length of edge 19; and a rectangular plate 21, which extends outwards of and parallel to rib 20, and has, on its top surface 22, two rectangular projections 23 aligned parallel to edge 19, and for the purpose explained below.

[0020] Rib 20 is the same thickness as plate 21 and inner wall 16, is located a given distance from inner wall 16, and is connected to inner wall 16 by a band 24 of flexible material on the outer side of inner wall 16. Plate 21, in turn, is located a given distance from rib 20 and connected to rib 20 by a band 25 of flexible material on the same side as band 24. In a variation not shown, a wider single band is substituted for bands 24 and 25, to connect rib 20 to both plate 21 and inner wall 16.

[0021] As shown in Figure 2, the free edge, parallel to edge 19, of outer wall 17 is fitted with an appendage, which forms part of support 14 and is defined by a flat rectangular wing 26 of the same thickness as outer wall 17 and connected to it by a band 27 of flexible material, so as to rotate 180° onto outer wall 17 (Figure 7) about an axis parallel to the free edge of outer wall 17.

[0022] As shown in Figures 5 and 6, outer wall 17 is shorter than inner wall 16, and, when wing 26 is coplanar with outer wall 17 and rib 20 is coplanar with inner wall 16, wing 26 overlaps rib 20 and an end portion of inner wall 16, and a free end edge 28 of wing 26 lies in a plane perpendicular to inner wall 16 and through the edge of rib 20 facing plate 21.

[0023] As shown in Figures 2 and 5, close to edge 28, wing 26 has three rectangular slits 29 aligned parallel to edge 28 and substantially contiguous, being separated solely by two thin intermediate partitions. As shown in Figure 1, two end portions of wing 26 project laterally from pocket 15, and are each fitted rigidly, on the side facing inner wall 16, with a permanent magnet 30 which, when wing 26 is coplanar with outer wall 17, cooperates with a respective metal plate 31 on inner wall 16 to define, with metal plate 31, a releasable retaining device 32 for holding wing 26 against inner wall 16, as described below.

[0024] Obviously, magnetic retaining device 32 described may be replaced with any other equivalent, e.g. hook-on, system.

[0025] As shown in Figures 1, 4 and 5, pocket 15 has a stand 33, which forms part of support 14 and is defined by a flat trapezoidal member hinged to the centre of the outer surface of inner wall 16 and movable from an open work position (Figures 1 and 4), in which stand 33 is perpendicular to inner wall 16 and supports pocket 15 in a raised position resting on end wall 18, and a closed rest position (Figure 5), in which stand 33 is folded onto inner wall 16.

[0026] Stand 33 is bounded at the top by a straight edge 34 with an elongated central cavity 35, which defines, on edge 34, an edge projection 37, and a projection 36 adjacent to and substantially coplanar with edge 19 of inner wall 16.

[0027] When stand 33 is in the open work position (Figure 4), edge 34 supports articulated appendage 16a square with inner wall 16. More specifically, in the open work position, rib 20 rests on projection 36, plate 21 is inserted inside cavity 35, and projection 37 engages a groove 38 on the rear edge of plate 21 to lock stand 33 transversely with respect to inner wall 16 and hold pocket 15 stably in the raised position.

[0028] As shown in Figures 1 and 4-7, device 1 comprises a folding device 39 defined by a flat rectangular plate, which is connected to inner wall 16, on the same side as articulated appendage 16a, is located over plate 21, and is bounded, on the side facing inner wall 16, by a straight edge 40 parallel to and facing edge 19. Close to its edge opposite and parallel to edge 40, folding device 39 has two rectangular slots 41 aligned parallel to edge 40 and spaced apart like projections 23 on plate 21.

[0029] Folding device 39 is joined to inner wall 16 by a band 42 of flexible material, which, on one side, is applied to inner wall 16, on the opposite side to band 24, and, on the other side, is applied to folding device 39, on the opposite side to that facing plate 21.

[0030] Band 42 therefore extends slidably over rib 20, and, as shown in Figures 4-7, is wide enough for folding device 39 to rotate, about an axis parallel to edges 40 and 19 and as described in detail below, between an initial rest position (Figure 4), in which folding device 39 is coplanar with rib 20 and rests on plate 21, with each slot 41 engaged by a respective projection 23, and a final work position (Figure 7), in which folding device 39 is flipped 180° with respect to the initial rest position and is coplanar with outer wall 17.

[0031] Operation of device 1 will now be described, as of the Figure 1 and 4 configuration, in which pocket 15, already loaded with bundle 2 positioned with its punched portion facing articulated appendage 16a, is in the raised position resting on stand 33, articulated appendage 16a

is positioned square with inner wall 16 as described above, and folding device 39 is in the initial rest position. The raised, almost vertical position of pocket 15 ensures bundle 2 inside is positioned resting and neatly compacted on end wall 18, and holes 3 are aligned correctly outside pocket 15 and projecting slightly from edge 19 (Figure 4).

[0032] In this position, wing 26 is positioned coplanar with outer wall 17 and facing an end portion 3b, projecting from outer wall 17, of the top sheet 3a in bundle 2, and is pressed against end portion 3b by retaining device 32 to hold end portion 3b firmly against inner wall 16.

[0033] In this position, device 1 is ready to receive a strip 5, which the user positions on folding device 39 (Figure 4) with adhesive face 10 facing upwards, and with edge 8 resting on bundle 2, so that teeth 7 extend through holes 3 and slits 29, with respective end portions projecting beyond wing 26.

[0034] The actual binding operation starts from this position, and comprises the following three steps :

Step 1 (Figure 5) : Stand 33 is folded back into the closed position, and articulated appendage 16a is rotated 90° with respect to inner wall 16 and positioned, with inner wall 16, resting on a flat support. Rotation of articulated appendage 16a folds teeth 7 ninety degrees with respect to rectangular portion 6, and sticks adhesive area 12 to the surface of bundle 2 between holes 3 and side 4. To improve grip, pressure may be applied to wing 26 to press the end of bundle 2 against rib 20.

Folding device 39 being connected integrally to plate 21 by projections 23 engaging slots 41, edge 40 moves upwards towards bundle 2, as articulated appendage 16a rotates, and so forces rectangular portion 6 to move slightly upwards and fold slightly along fold line 6a.

Step 2 (Figure 6) : Folding device 39 is rotated 90° about an axis parallel to edges 40 and 19, is guided downwards to insert edge 40 inside the gap between rib 20 and plate 21, and is pushed against side 4 and edge 28 of wing 26 to fold rectangular portion 6 into an L about fold line 6a.

Step 3 (Figure 7) : Wing 26 is flipped 180° onto outer wall 17, and folding device 39 is rotated 90° onto bundle 2, so as to fold rectangular portion 6 directly into a U about side 4, and fold the ends of teeth 7 onto bundle 2 indirectly by means of rectangular portion 6.

[0035] Folding rectangular portion 6 sticks adhesive area 13 to the top sheet in bundle 2, i.e. the sheet facing outer wall 17, thus securing strip 5 to bundle 2 and, at the same time, looping each tooth 7 through respective hole 3 to bind the sheets in bundle 2 firmly to one another.

[0036] Adhesion of rectangular portion 6 to the top sheet in bundle 2 may be strengthened by pressing folding device 39 against bundle 2.

[0037] The above operation of device 1 in Figures 1-7 also applies to the Figure 8-13 variation, which differs from the above embodiment as follows :

- End wall 18 is formed integrally with inner wall 16 and hinged to outer wall 17 by a hinge pin 43 parallel to edge 19.
- Wing 26 is hinged to outer wall 17 by a hinge pin 44 parallel to pin 43 and edge 19.
- Longitudinal opening 29 is defined by a row of equally spaced openings sized to permit insertion of teeth 7 through wing 26.
- Rib 20 is integral with plate 21, defines with it a rigid appendage 45 (substituting for articulated appendage 16a), and is hinged to edge 19 of inner wall 16 by a hinge pin 46 parallel to edge 19; rib 20 is substantially contiguous to and the same thickness as inner wall 16; and plate 21 is lower than rib 20 by an amount equal to the thickness of folding device 39, and is connected to rib 20 by a groove 47 parallel to edge 19.
- Stand 33 is hinged to the outer surface of inner wall 16 by a pin 48, which is spaced apart from edge 19 to avoid interfering with appendage 45, and extends parallel to edge 19 to allow stand 33 to rotate between a closed position (Figure 12), in which stand 33 is inserted inside a cavity formed in the outer surface of inner wall 16, and an open position (Figure 8), in which stand 33 is rotated outwards roughly 45° with respect to inner wall 16. In this case, when positioned square with inner wall 16 (Figure 9), appendage 45 is supported, not by stand 33, but by two 45° bevels 49, which extend parallel to edge 19, are radial with respect to pin 46, and are formed on the bottom surface of appendage 45 and the outer surface of inner wall 16 respectively.
- Folding device 39 is hinged to inner wall 16 by an articulated joint comprising two levers 50 located at the longitudinal ends of folding device 39, so as to be located outwards of the longitudinal ends of side 4 when bundle 2 is inserted inside pocket 15. More specifically, as shown in Figures 9 to 13, each lever 50 is defined by a bar hinged at one end to pin 46 and having a slot 51 engaged in transversely sliding manner by a pin 52 parallel to edge 19, integral with folding device 39, and projecting laterally from the sides of folding device 39 close to front edge 40.

[0038] As shown in Figure 9, when folding device 39 is in the initial rest position, i.e. contacting appendage 45 positioned square with inner wall 16, each lever 50 is perpendicular to edge 19, parallel to folding device 39, and housed entirely inside a respective seat 53 defined partly by a slot 54 formed through folding device 39, and partly by a recess 55 formed in rib 20 and plate 21.

[0039] As shown in Figure 10, each lever 50 remains inside respective seat 53 even when appendage 45 is rotated and positioned coplanar with inner wall 16 (Step

1 described above). In this connection, it is important to note that, unlike the previous embodiment, the geometry of appendage 45 and folding device 39 is such that, as appendage 45 rotates, folding device 39, as opposed to moving upwards with respect to rib 20, remains rigidly connected to appendage 45, so rectangular portion 6 of strip 5 remains flat on the surface formed by rib 20 and folding device 39. This prevents any uncontrolled movement of folding device 39 with respect to appendage 45 and edge 19 from producing flaws in the fold of strip 5 along fold line 6a.

[0040] As shown in Figure 11 and with reference to Step 2 described above, folding device 39 is subsequently rotated 90°, and, by rotating levers 50 about pin 46 and inserting them partly inside respective recesses 55, is lowered to insert edge 40 inside groove 47.

[0041] Subsequent 90° rotation of folding device 39 onto bundle 2 (Step 2 described above) is made possible by rotating levers 50 upwards about pin 46, sliding pin 52 along slot 51, and rotating folding device 39 about pin 52.

Claims

1. A method of manually binding a bundle (2) of sheets with a strip (5) of flexible material having an adhesive face (10), and teeth (7) arranged 'comb-fashion' along one edge (8); the bundle (2) having a straight side (4), and a number of through holes (3) adjacent to said side (4);
the method comprising the steps of:

- providing a support (14) comprising a pocket (15), in turn comprising an inner wall (16), an outer wall (17), and an end wall (18) crosswise to the inner wall (16) and the outer wall (17); the inner wall (16) having a straight free edge (19) parallel to the end wall (18);
- inserting the bundle (2) inside the pocket (15) so the through holes (3) project outwards of said free edge (19), said side (4) is parallel to the free edge (19), the top sheet (3a) in the bundle (2) faces the outer wall (17), and an end portion (3b) of the top sheet projects outwards of the outer wall (17);
- inserting each tooth (7) through a respective said through hole (3) so an end portion (9) of each tooth (7) projects from the respective through hole (3) on the top sheet (3a) side; the tooth (7) being inserted by positioning a first face, opposite the adhesive face (10), of the strip (5) on a flat folding device (39) positioned facing and parallel to said free edge (19);

the method being **characterized by** comprising the further step of:

- folding the strip (5) into a U about said side (4) by rotating the folding device (39) about a hinge axis parallel to said free edge (19), so as to fold said end portions (9) of the teeth (7) onto the end portion (3b) of the top sheet (3a), and stick the adhesive face (10) of the strip (5) to the top sheet (3a), with the end portions (9) of the teeth (7) gripped between the strip (5) and the top sheet (3a).

2. A method as claimed in Claim 1, wherein adhesion of the strip (5) to the top sheet (3a) is ensured by exerting pressure on the folding device (39) to press it onto the end portion (3b) of the top sheet (3a).

3. A method as claimed in Claim 1 or 2, wherein the step of folding the strip (5) into a U comprises the substeps of:

- positioning the folding device (39) in a first position square with the inner wall (16), so as to support the strip (5) flat, with the teeth (7) inserted through the respective through holes (3);
- rotating the folding device (39) into a second position coplanar with the inner wall (16), so as to fold the teeth (7) square with the rest of the strip (5);
- rotating the folding device (39) further into a third position square with the inner wall (16), so as to apply the strip (5) onto said side (4); and
- rotating the folding device (39) further into a fourth position superimposed on and contacting the end portion (3b) of the top sheet (3a).

4. A method as claimed in Claim 3, wherein the inner wall (16) has a movable first appendage (16a, 45) facing said free edge (19); the first appendage (16a, 45) being moved between a position square with the inner wall (16) when the folding device (39) is in said first position, and a position coplanar with the inner wall (16) when the folding device (39) is in said second position.

5. A method as claimed in Claim 4, wherein the first appendage (16a, 45) comprises a flat plate (21); and a rib (20), which is parallel and hinged to said free edge (19), and is interposed between said free edge (19) and said side (4) when the folding device (39) is in the second, third and fourth position.

6. A method as claimed in Claim 5, wherein the folding device (39) is maintained constrained in contact with said plate (21) in said first and second position; the first appendage (16a, 45) moving with the folding device (39) from the first to the second position.

7. A method as claimed in one of Claims 3 to 6, wherein the outer wall (17) comprises a second appendage (26), which is moved from a position contacting the end portion (3b) of the top sheet (3a), to a position

flipped 180° onto the outer wall (17), when the folding device (39) is moved from the third to the fourth position.

8. A device for manually binding a bundle (2) of sheets with a strip (5) of flexible material having an adhesive face (10), and teeth (7) arranged 'comb-fashion' along one edge; the bundle (2) having a straight side (4), and a number of through holes (3) adjacent to said side (4); the device (1) comprising a support (14), in turn comprising a pocket (15) for housing the bundle (2) of sheets, and which comprises an inner wall (16), an outer wall (17), and an end wall (18) crosswise to the inner wall (16) and outer wall (17); the inner wall (16) having a straight free edge (19) parallel to the end wall (18); the outer wall (17) being shorter than the inner wall (16), so that, when the bundle (2) is inserted inside the pocket (15), the through holes (3) project outwards of said free edge (19), said side (4) is parallel to the free edge (19), the top sheet (3a) in the bundle (2) faces the outer wall (17), and an end portion (3b) of the top sheet projects outwards of the outer wall (17);
the device (1) being **characterized by** comprising a flat folding device (39) facing and parallel to said free edge (19), and which is movable with respect to the inner wall (16) to rotate, about a hinge axis parallel to said free edge (19), between an initial position square with the inner wall (16), an intermediate position coplanar with the inner wall (16), and a final position coplanar with the outer wall (17).

9. A device as claimed in Claim 8, wherein the inner wall (16) has a first appendage (16a, 45) facing said free edge (19) and movable between a position square with the inner wall (16), and a position coplanar with the inner wall (16); the first appendage (16a, 45) being fitted with connecting means (23) for connecting the folding device (39) to the first appendage (16a, 45) in said initial and intermediate positions.

10. A device as claimed in Claim 9, wherein the first appendage (16a, 45) comprises a rib (20) parallel and hinged to said free edge (19), and a flat plate (21) connected to the rib (20); said connecting means (23) being fitted to the plate (21).

11. A device as claimed in Claim 9 or 10, wherein the first appendage (45) is hinged to the inner wall (16) to rotate about a fixed first pin (46) parallel to the free edge (19); the folding device (39) being hinged to the inner wall (16) by articulated means (50) designed to allow the folding device (39) to flip 180°, about said side (4), from the intermediate position to the final position.

12. A device as claimed in Claim 11, wherein the articulated means (50) comprise two levers (50), each of which is hinged at one end to the first pin (46), and has a slot (51) engaged in transversely sliding manner by a second pin (52) parallel to the free edge (19) and integral with an edge portion of the folding device (39) facing the free edge (19).

13. A device as claimed in one of Claims 9 to 12, wherein the support (14) comprises a stand (33) connected to the inner wall (16) and for supporting the pocket (15) in a raised position resting on the end wall (18).

14. A device as claimed in Claim 13, wherein the stand (33) is hinged to the inner wall (16) and movable between a work position crosswise to the inner wall (16) and supporting the pocket (15) in the raised position, and a rest position folded onto the inner wall (16) to set the pocket (15) to a reclining position.

15. A device as claimed in one of Claims 8 to 14, wherein the outer wall (17) has a second appendage (26) hinged to the outer wall (17) and movable from a position coplanar with the outer wall (17), to a position flipped 180° onto the outer wall (17).

16. A device as claimed in Claim 15, wherein the second appendage (26) is defined by a flat wing (26) having a longitudinal through opening (29), which, in use and when the second appendage (26) is positioned coplanar with the outer wall (17), is positioned facing the through holes (3) in the bundle (2) inserted inside the pocket (15).

17. A device as claimed in Claim 15 or 16, wherein releasable retaining means (32) hold the second appendage (26) in position coplanar with the outer wall (17).

Patentansprüche

1. Verfahren zum manuellen Binden eines Bündels (2) von Blättern mit einem Streifen (5) von flexiblem Material, welcher eine Adhäsivfläche (10) aufweist, und Zähne (7), welche "kammartig" entlang einer Kante (8) angeordnet sind; wobei das Bündel (2) eine gerade Seite (4) und eine Anzahl von Durchgangslöchern (3) benachbart zu der Seite (4) aufweist;
wobei das Verfahren die Schritte umfasst:

- Bereitstellen einer Halterung (14), umfassend eine Tasche (15), welche ihrerseits eine Innenwand (16), eine Außenwand (17) und eine Endwand (18) quer zu der Innenwand (16) und der Außenwand (17) umfasst; wobei die Innenwand (16) eine gerade freie Kante (19) parallel zu der Endwand (18) aufweist;
- Einführen des Bündels (2) in das Innere der Tasche (15), derart, dass die Durchgangslöcher

(3) bezüglich der freien Kante (19) nach außen vorstehen, die Seite (4) parallel zu der freien Kante (19) ist, das Oberblatt (3a) in dem Bündel (2) der Außenwand (17) zugewandt ist und ein Endabschnitt (3b) des Oberblatts bezüglich der Außenwand (17) nach außen vorsteht;
- Einführen jedes Zahns (7) durch ein entsprechendes Durchgangsloch (3), derart, dass ein Endabschnitt (9) jedes Zahns (7) aus dem jeweiligen Durchgangsloch (3) auf der Seite des Oberblatts (3a) herausragt; wobei der Zahn (7) eingeführt wird durch Positionieren einer der Adhäsivfläche (10) gegenüberliegenden ersten Fläche des Streifens (5) an einer flachen Faltvorrichtung (39), welche der freien Kante (19) zugewandt und parallel zu dieser positioniert ist;

wobei das Verfahren **dadurch gekennzeichnet** ist, dass es als weiteren Schritt umfasst:

- Falten des Streifens (5) zu einem U um die Seite (4) herum durch Drehen der Faltvorrichtung (39) um eine Scharnierachse, welche parallel zu der freien Kante (19) verläuft, um die Endabschnitte (9) der Zähne (7) auf den Endabschnitt (3b) des Oberblatts (3a) umzufalten und die Adhäsivfläche (10) des Streifens (5) an das Oberblatt (3a) zu kleben, wobei die Endabschnitte (9) der Zähne (7) zwischen dem Streifen (5) und dem Oberblatt (3a) gegriffen sind.

2. Verfahren nach Anspruch 1, wobei die Adhäsion des Streifens (5) an dem Oberblatt (3a) sichergestellt wird durch Ausüben eines Drucks auf die Faltvorrichtung (39), um diese an den Endabschnitt (3b) des Oberblatts (3a) anzupressen.

3. Verfahren nach Anspruch 1 oder 2, wobei der Schritt des Faltens des Streifens (5) zu einem U als Unterschritte umfasst:

- Positionieren der Faltvorrichtung (39) in einer zu der Innenwand (16) rechtwinkligen ersten Position, um den Streifen (5) flachliegend zu halten, bei durch die entsprechenden Durchgangslöcher (3) eingeführten Zähnen (7);
- Drehen der Faltvorrichtung (39) in eine zu der Innenwand (16) koplanare zweite Position, um die Zähne (7) rechtwinklig zum Rest des Streifens (5) umzufalten;
- Drehen der Faltvorrichtung (39) weiter in eine zu der Innenwand (16) rechtwinklige dritte Position, um den Streifen (5) auf die Seite (4) aufzubringen; und
- Drehen der Faltvorrichtung (39) weiter in eine den Endabschnitt (3b) des Oberblatts (3a) überlagernde und denselben kontaktierende vierte Position.

4. Verfahren nach Anspruch 3, wobei die Innenwand (16) einen beweglichen ersten Fortsatz (16a, 45) aufweist, welcher der freien Kante (19) zugewandt ist; wobei der erste Fortsatz (16a, 45) bewegt wird zwischen einer zu der Innenwand (16) rechtwinkligen Position, wenn sich die Faltvorrichtung (39) in der ersten Position befindet, und einer zu der Innenwand (16) koplanaren Position, wenn sich die Faltvorrichtung (39) in der zweiten Position befindet.

5. Verfahren nach Anspruch 4, wobei der erste Fortsatz (16a, 45) eine flache Platte (21) umfasst und eine Rippe (20), welche parallel zu der freien Kante (19) angeordnet und an derselben angelenkt ist und zwischen der freien Kante (19) und der Seite (4) zwischengeschaltet ist, wenn sich die Faltvorrichtung (39) in der zweiten, dritten und vierten Position befindet.

6. Verfahren nach Anspruch 5, wobei die Faltvorrichtung (39) in der ersten und zweiten Position in Zwangskontakt mit der Platte (21) gehalten wird; wobei sich der erste Fortsatz (16a, 45) mit der Faltvorrichtung (39) von der ersten in die zweite Position bewegt.

7. Verfahren nach einem der Ansprüche 3 bis 6, wobei die Außenwand (17) einen zweiten Fortsatz (26) aufweist, welcher bei Bewegung der Faltvorrichtung (39) von der dritten in die vierte Position bewegt wird von einer Position, in der er den Endabschnitt (3b) des Oberblatts (3a) kontaktiert, in eine Position, in der er um 180° auf die Außenwand (17) gedreht ist.

8. Vorrichtung zum manuellen Binden eines Bündels (2) von Blättern mit einem Streifen (5) von flexiblem Material, welcher eine Adhäsivfläche (10) aufweist, und Zähnen (7), welche "kammartig" entlang einer Kante angeordnet sind; wobei das Bündel (2) eine gerade Seite (4) und eine Anzahl von Durchgangslöchern (3) benachbart zu der Seite (4) aufweist; die Vorrichtung (1) umfassend: eine Halterung (14), welche ihrerseits eine Tasche (15) umfasst zum Aufnehmen des Bündels (2) von Blättern, wobei die Tasche (15) eine Innenwand (16), eine Außenwand (17) und eine Endwand (18) quer zu der Innenwand (16) und der Außenwand (17) umfasst; wobei die Innenwand (16) eine gerade freie Kante (19) parallel zu der Endwand (18) aufweist; wobei die Außenwand (17) kürzer ist als die Innenwand (16), so dass bei Einführung des Bündels (2) in das Innere der Tasche (15) die Durchgangslöcher (3) bezüglich der freien Kante (19) nach außen vorstehen, die Seite (4) parallel zu der freien Kante (19) ist, das Oberblatt (3a) in dem Bündel (2) der Außenwand (17) zugewandt ist und ein Endabschnitt (3b) des Oberblatts

bezüglich der Außenwand (17) nach außen vorsteht; wobei die Vorrichtung (1) **dadurch gekennzeichnet** ist, dass sie umfasst: eine flache Faltvorrichtung (39), welche der freien Kante (19) zugewandt und parallel zu dieser ist und welche bezüglich der Innenwand (16) beweglich ist, um sich um eine Scharnierachse, welche parallel zu der freien Kante (19) verläuft, zwischen einer zu der Innenwand (16) rechtwinkligen Anfangsposition, einer zu der Innenwand (16) koplanaren Zwischenposition und einer zu der Außenwand (17) koplanaren End-position zu drehen.

9. Vorrichtung nach Anspruch 8, wobei die Innenwand (16) einen ersten Fortsatz (16a, 45) aufweist, welcher der freien Kante (19) zugewandt und zwischen einer zu der Innenwand (16) rechtwinkligen Position und einer zu der Innenwand (16) koplanaren Position beweglich ist; wobei der erste Fortsatz (16a, 45) mit Verbindungsmitteln (23) ausgerüstet ist zum Verbinden der Faltvorrichtung (39) mit dem ersten Fortsatz (16a, 45) in der Anfangs- und Zwischenposition.

10. Vorrichtung nach Anspruch 9, wobei der erste Fortsatz (16a, 45) eine Rippe (20), welche parallel zu der freien Kante (19) und an derselben angelenkt ist, und eine mit der Rippe (20) verbundene flache Platte (21) umfasst; wobei die Verbindungsmittel (23) an der Platte (21) angeordnet sind.

11. Vorrichtung nach Anspruch 9 oder 10, wobei der erste Fortsatz (45) an der Innenwand (16) angelenkt ist, um sich um einen festen ersten Stift (46) parallel zu der freien Kante (19) zu drehen; wobei die Faltvorrichtung (39) über Gelenkmittel (50) an der Innenwand (16) angelenkt ist, welche dazu ausgebildet sind, der Faltvorrichtung (39) eine 180°-Drehung um die Seite (4) von der Zwischenposition in die Endposition zu ermöglichen.

12. Vorrichtung nach Anspruch 11, wobei die Gelenkmittel (50) zwei Hebel (50) umfassen, von denen jeder an einem Ende des ersten Stiftes (46) angelenkt ist und einen Schlitz (51) aufweist, in welchen ein zweiter Stift (52) in Querrichtung gleitend eingreift, welcher parallel zu der freien Kante (19) angeordnet und einstückig mit einem der freien Kante (19) zugewandten Randabschnitt der Faltvorrichtung (39) ausgebildet ist.

13. Vorrichtung nach einem der Ansprüche 9 bis 12, wobei die Halterung (14) einen mit der Innenwand (16) verbundenen Ständer (33) umfasst zum Halten der Tasche (15) in einer auf der Endwand (18) abgestützten angehobenen Position.

14. Vorrichtung nach Anspruch 13, wobei der Ständer (33) an der Innenwand (16) angelenkt ist und zwischen einer bezüglich der Innenwand (16) quer gerichteten und die Tasche (15) in der angehobenen Position haltenden Arbeitsposition und einer auf die Innenwand (16) umgefalteten Ruheposition beweglich ist, um die Tasche (15) in eine zurückgelegte Position zu setzen.

15. Vorrichtung nach einem der Ansprüche 8 bis 14, wobei die Außenwand (17) einen zweiten Fortsatz (26) aufweist, welcher an der Außenwand (17) angelenkt ist und von einer zu der Außenwand (17) koplanaren Position in eine um 180° auf die Außenwand (17) gedrehte Position beweglich ist.

16. Vorrichtung nach Anspruch 15, wobei der zweite Fortsatz (26) definiert ist durch einen flachen Flügel (26) mit einer längslaufenden Durch-gangsöffnung (29), welcher im Gebrauch und bei koplanar zu der Außenwand (17) positioniertem zweiten Fortsatz (26) den Durchgangslöchern (3) in dem in das Innere der Tasche (15) eingeführten Bündel (2) zugewandt positioniert ist.

17. Vorrichtung nach Anspruch 15 oder 16, wobei lösbare Rückhaltemittel (32) den zweiten Fortsatz (26) in einer zu der Außenwand (17) koplanaren Position halten.

Revendications

1. Procédé destiné à relier manuellement un paquet (2) de feuilles avec une bande (5) d'un matériau souple ayant une face adhésive (10), et des dents (7) disposées « en peigne » le long d'un bord (8), le paquet (2) ayant un côté droit (4), et un certain nombre de trous débouchants (3) adjacents audit côté (4), le procédé comprenant les étapes consistant à :

- fournir un support (14) comprenant une poche (15), comprenant à son tour une paroi intérieure (16), une paroi extérieure (17), et une paroi d'extrémité (18) transversale par rapport à la paroi intérieure (16) et à la paroi extérieure (17), la paroi intérieure (16) ayant un bord d'extrémité droit (19) parallèle à la paroi d'extrémité (18),
- insérer le paquet (2) à l'intérieur de la poche (15) de sorte que les trous débouchants (3) dépassent vers l'extérieur par rapport audit bord libre (19), ledit côté (4) est parallèle au bord libre (19), la feuille supérieure (3a) dans le paquet (2) est orientée vers la paroi extérieure (17), et une partie d'extrémité (3b) de la feuille supérieure dépasse vers l'extérieur par rapport à la paroi extérieure (17),
- insérer chaque dent (7) à travers un dit trou débouchant respectif (3) de sorte qu'une partie d'extrémité (9) de chaque dent (7) dépasse par

rapport au trou débouchant respectif (3) du côté de la feuille supérieure (3a), la dent (7) étant insérée en positionnant une première face, opposée à la face adhésive (10), de la bande (5) sur un dispositif de pliage plat (39) positionné en étant orienté vers ledit bord libre (19) et parallèle à celui-ci, le procédé étant **caractérisé par** le fait de comprendre l'étape supplémentaire consistant à :

- plier la bande (5) en un U autour dudit côté (4) en faisant tourner le dispositif de pliage (39) autour d'un axe de charnière parallèle audit bord d'extrémité libre (19), de manière à plier lesdites parties d'extrémité (9) des dents (7) sur la partie d'extrémité (3b) de la feuille supérieure (3a), et coller la face adhésive (10) de la bande (5) sur la feuille supérieure (3a), avec les parties d'extrémité (9) des dents (7) serrées entre la bande (5) et la feuille supérieure (3a).

2. Procédé selon la revendication 1, dans lequel l'adhérence de la bande (5) sur la feuille supérieure (3a) est assurée en exerçant une pression sur le dispositif de pliage (39) pour l'appuyer sur la partie d'extrémité (3b) sur la feuille supérieure (3a)

3. Procédé selon la revendication 1 ou 2, dans lequel l'étape de pliage de la bande (5) en un U comprend les sous-étapes consistant à :

- positionner le dispositif de pliage (39) dans une première position perpendiculaire à la paroi intérieure (16), de manière à supporter la bande (5) à plat, avec les dents insérées à travers les trous débouchants respectifs (3),
- faire tourner le dispositif de pliage (39) vers une deuxième position coplanaire par rapport à la paroi intérieure (16), de manière à plier les dents perpendiculairement au reste de la bande (5),
- faire tourner davantage le dispositif de pliage (39) vers une troisième position perpendiculaire à la paroi intérieure (16), de manière à appliquer la bande (5) sur ledit côté (4), et
- faire tourner davantage le dispositif de pliage (39) vers une quatrième position superposée et en contact avec la partie d'extrémité (3b) de la feuille supérieure (3a).

4. Procédé selon la revendication 3, dans lequel la paroi intérieure (16) possède un premier appendice mobile (16a, 45) orienté vers ledit bord libre (19), ledit premier appendice (16a, 45) étant déplacé entre une position perpendiculaire à la paroi intérieure (16) lorsque le dispositif de pliage (39) se trouve dans ladite première position, et une position coplanaire par rapport à la paroi intérieure (16) lorsque le dispositif de pliage (39) se trouve dans ladite deuxième position.

5. Procédé selon la revendication 4, dans lequel le premier appendice (16a, 45) comprend une plaque plate (21), et une nervure (20), qui est parallèle et articulée par rapport audit bord libre (19), et est interposée entre ledit bord libre (19) et ledit côté (4) lorsque le dispositif de pliage (39) se trouve dans les deuxième, troisième et quatrième positions.

6. Procédé selon la revendication 5, dans lequel le dispositif de pliage (39) est maintenu contraint en contact avec ladite plaque (21) dans lesdites première et deuxième positions, le premier appendice (16a, 45) se déplaçant avec le dispositif de pliage (39) de la première à la deuxième position.

7. Procédé selon l'une des revendications 3 à 6, dans lequel la paroi extérieure (17) comprend un deuxième appendice (26), qui est déplacé à partir d'une position de contact avec la partie d'extrémité (3b) de la feuille supérieure (3a), à une position basculée de 180° sur la paroi extérieure (17), lorsque le dispositif de pliage (39) est déplacé de la troisième à la quatrième position.

8. Dispositif destiné à relier manuellement un paquet (2) de feuilles avec une bande d'un matériau souple ayant une face adhésive (10), et des dents (7) disposées « en peigne » le long d'un bord, le paquet (2) ayant un côté droit (4), et un certain nombre de trous débouchants (3) adjacents audit côté (4), le dispositif comprenant un support (14), comprenant à son tour une poche (15) destinée à recevoir le paquet (2) de feuilles, et qui comprend une paroi intérieure (16), une paroi extérieure (17), et une paroi d'extrémité (18) transversale par rapport à la paroi intérieure (16) et à la paroi extérieure (17), la paroi intérieure (16) ayant un bord d'extrémité droit (19) parallèle à la paroi d'extrémité (18), la paroi extérieure (17) étant plus courte que la paroi intérieure (16), de sorte que, lorsque le paquet (2) est inséré à l'intérieur de la poche (15), les trous débouchants (3) dépassent vers l'extérieur par rapport audit bord libre (19), ledit côté (4) est parallèle au bord libre (19), la feuille supérieure (3a) dans le paquet (2) est orientée vers la paroi extérieure (17), et une partie d'extrémité (3b) de la feuille supérieure dépasse vers l'extérieur par rapport à la paroi extérieure (17),
le dispositif (1) étant **caractérisé par** le fait de comprendre un dispositif de pliage plat (39) orienté vers ledit bord libre (19) et parallèle à celui-ci, et qui est mobile par rapport à la paroi intérieure (16) pour tourner, autour d'un axe de charnière parallèle audit bord libre (19), entre une position initiale perpendiculaire à la paroi intérieure (16), une position intermédiaire coplanaire par rapport à la paroi intérieure (16), et une position finale coplanaire par rapport à la paroi

extérieure (17).

9. Dispositif selon la revendication 8, dans lequel paroi intérieure (16) possède un premier appendice (16a, 45) orienté vers ledit bord libre (19) et mobile entre une position perpendiculaire à la paroi intérieure (16), et une position coplanaire par rapport à la paroi intérieure (16), le premier appendice (16a, 45) étant monté avec un moyen de connexion (23) en vue d'une connexion du dispositif de pliage (39) avec le premier appendice (16a, 45) dans lesdites positions initiale et intermédiaire.

10. Dispositif selon la revendication 9, dans lequel le premier appendice (16a, 45) comprend une nervure (20) parallèle et articulée par rapport audit bord libre (19), et une plaque plate (21) connectée à la nervure (20), ledit moyen de connexion (23) étant monté sur la plaque (21).

11. Dispositif selon la revendication 9 ou 10, dans lequel le premier appendice (45) est articulé par rapport à la paroi intérieure (16) pour tourner autour d'une première broche fixe (46) parallèle au bord libre (19), le dispositif de pliage (39) étant articulé par rapport à la paroi intérieure (16) par un moyen articulé (50) conçu pour permettre au dispositif de pliage (39) de basculer de 180°, autour dudit côté (4), de la position intermédiaire à la position finale.

12. Dispositif selon la revendication 11, dans lequel le moyen articulé (50) comprend deux leviers (50), dont chacun est articulé à une extrémité par rapport à la première broche (46), et possède une fente (51) engagée d'une manière coulissante transversalement par une deuxième broche (52) parallèle au bord libre (19) et solidaire d'une partie de bord du dispositif de pliage (39) orientée vers le bord libre (19).

13. Dispositif selon l'une des revendications 9 à 12, dans lequel le support (14) comprend un montant (33) connecté à la paroi intérieure (16) et destiné à supporter la poche (15) dans une position relevée reposant sur la paroi d'extrémité (18).

14. Dispositif selon la revendication 13, dans lequel le montant (33) est articulé par rapport à la paroi intérieure (16) et mobile entre une position de travail transversale par rapport à la paroi intérieure (16) et supportant la poche (15) dans la position relevée, et une position de repos repliée sur la paroi intérieure (16) pour placer la poche (15) dans une position inclinée.

15. Dispositif selon l'une des revendications 8 à 14, dans lequel la paroi extérieure (17) possède un deuxième appendice (26) articulé par rapport à la paroi extérieure (17) et mobile entre une position coplanaire par rapport à la paroi extérieure (17), et une position basculée de 180° sur la paroi extérieure (17).

16. Dispositif selon la revendication 15, dans lequel le deuxième appendice est défini par une aile plate (26) ayant une ouverture débouchante longitudinale (29), qui, en utilisation et lorsque le deuxième appendice (26) est positionné de manière coplanaire par rapport à la paroi extérieure (17), est positionnée en étant orientée vers les trous débouchants (3) dans le paquet (2) inséré dans la poche (15).

17. Dispositif selon la revendication 15 ou 16, dans lequel un moyen de retenue libérable (32) maintient le deuxième appendice (26) dans une position coplanaire par rapport à la paroi extérieure (17).

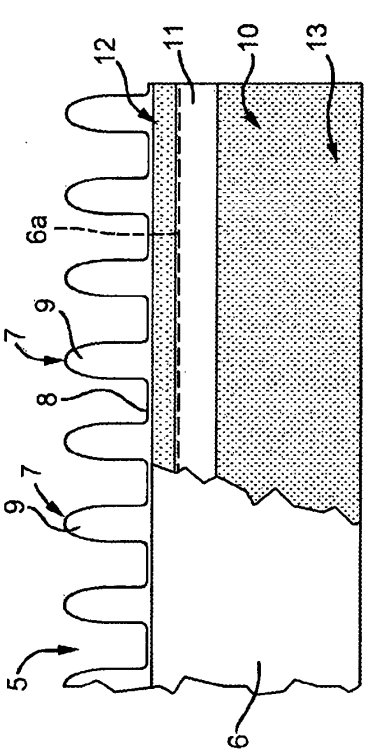

FIG. 3

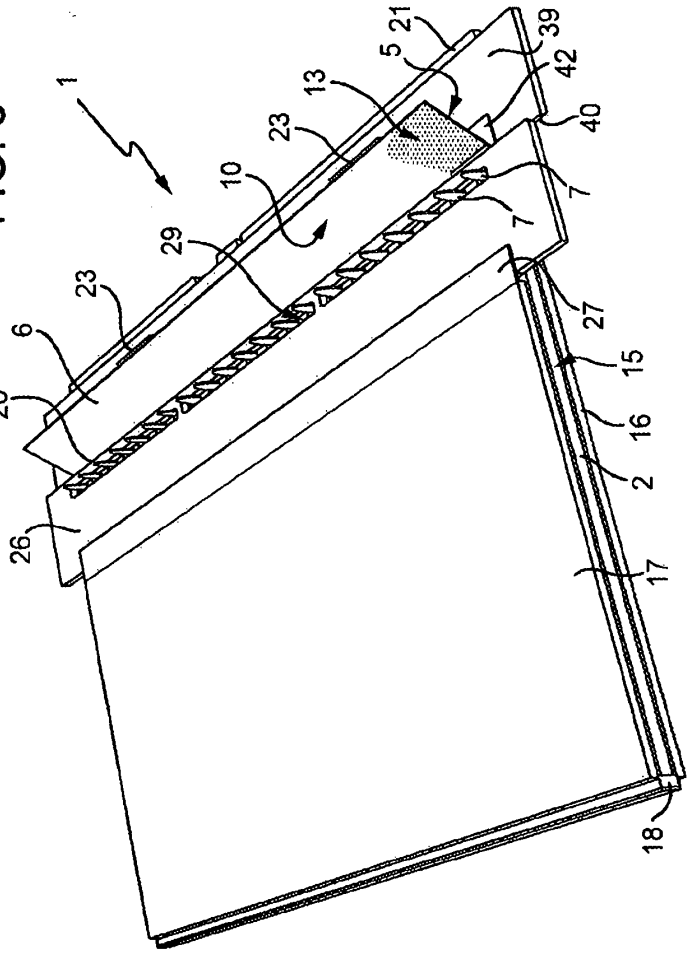

FIG. 2

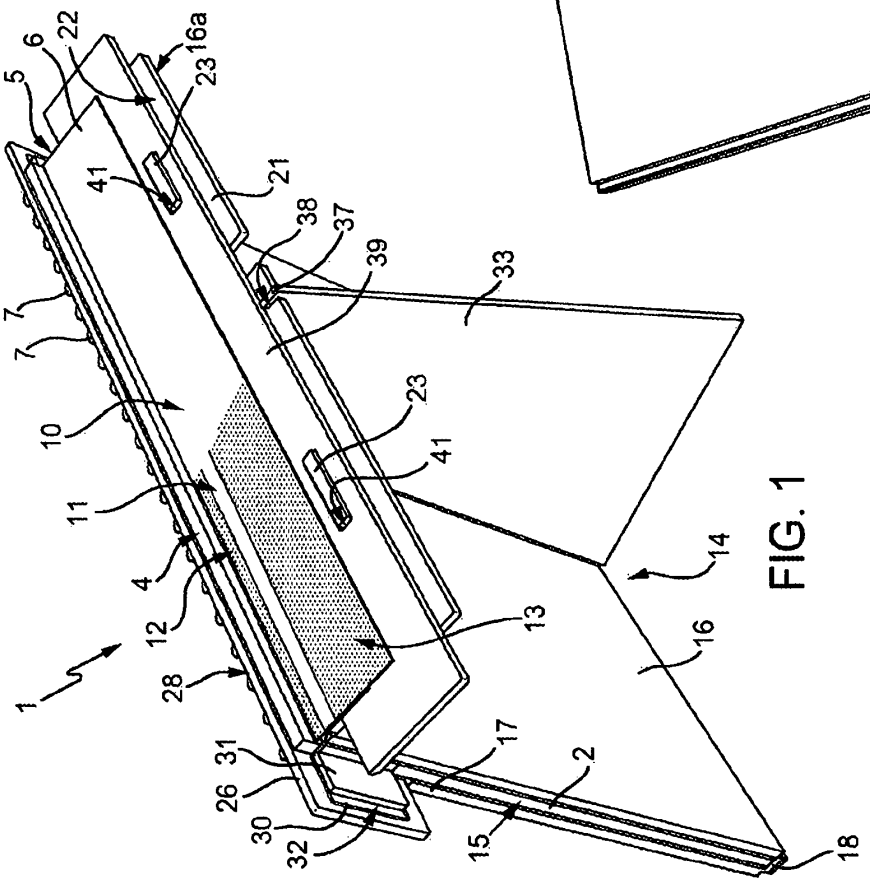

FIG. 1

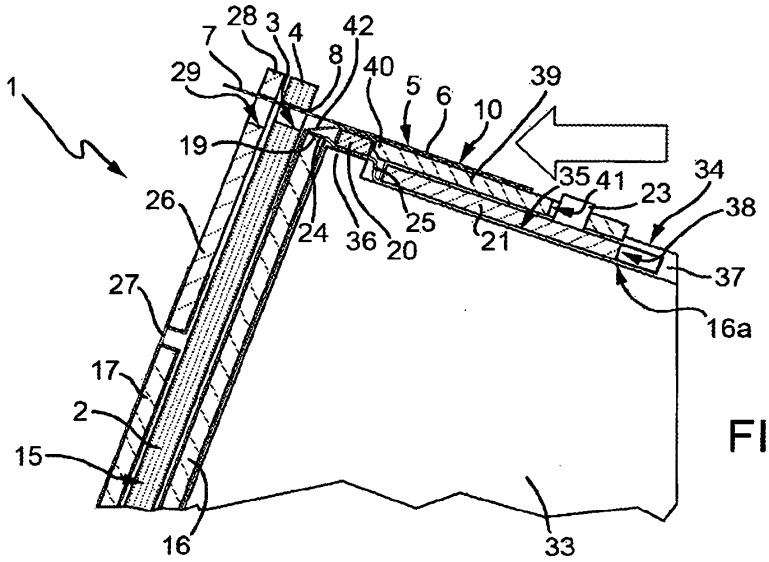

FIG. 4

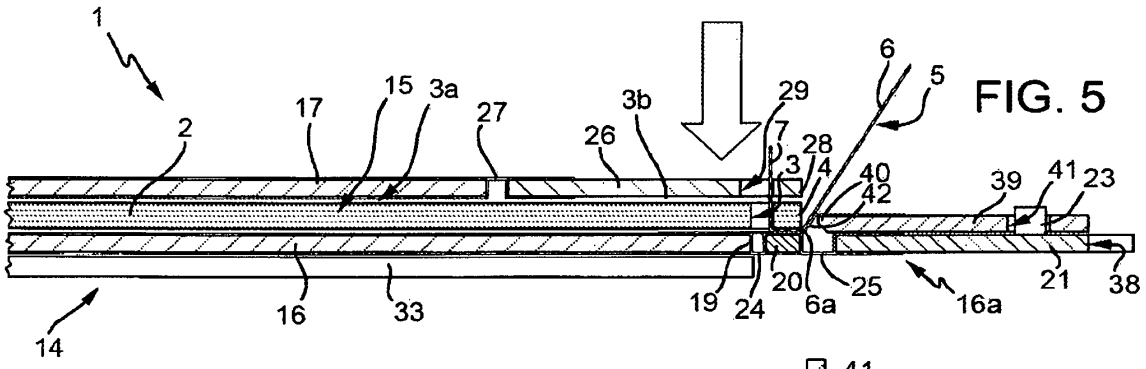

FIG. 5

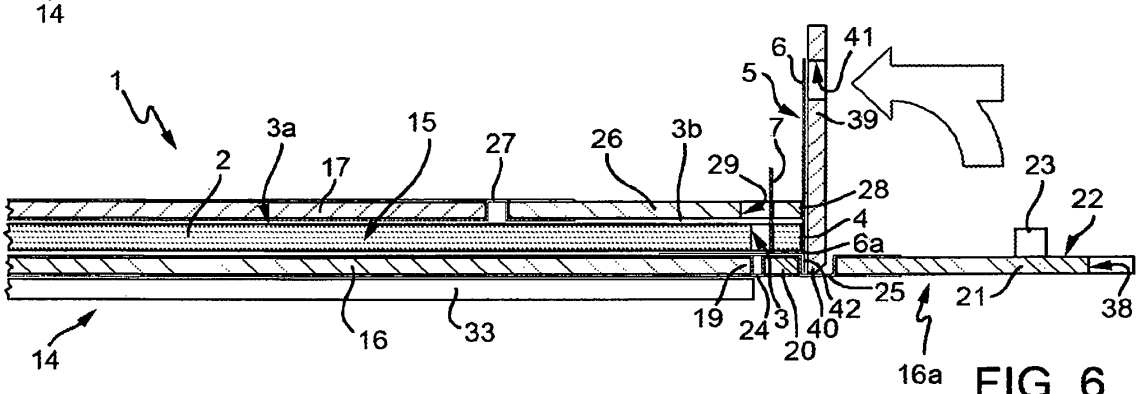

FIG. 6

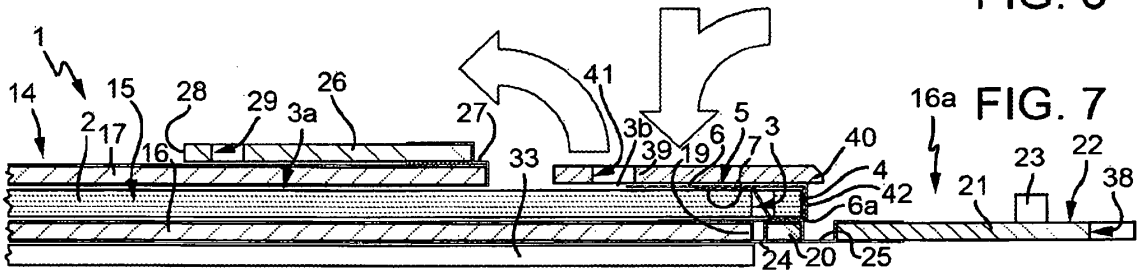

FIG. 7

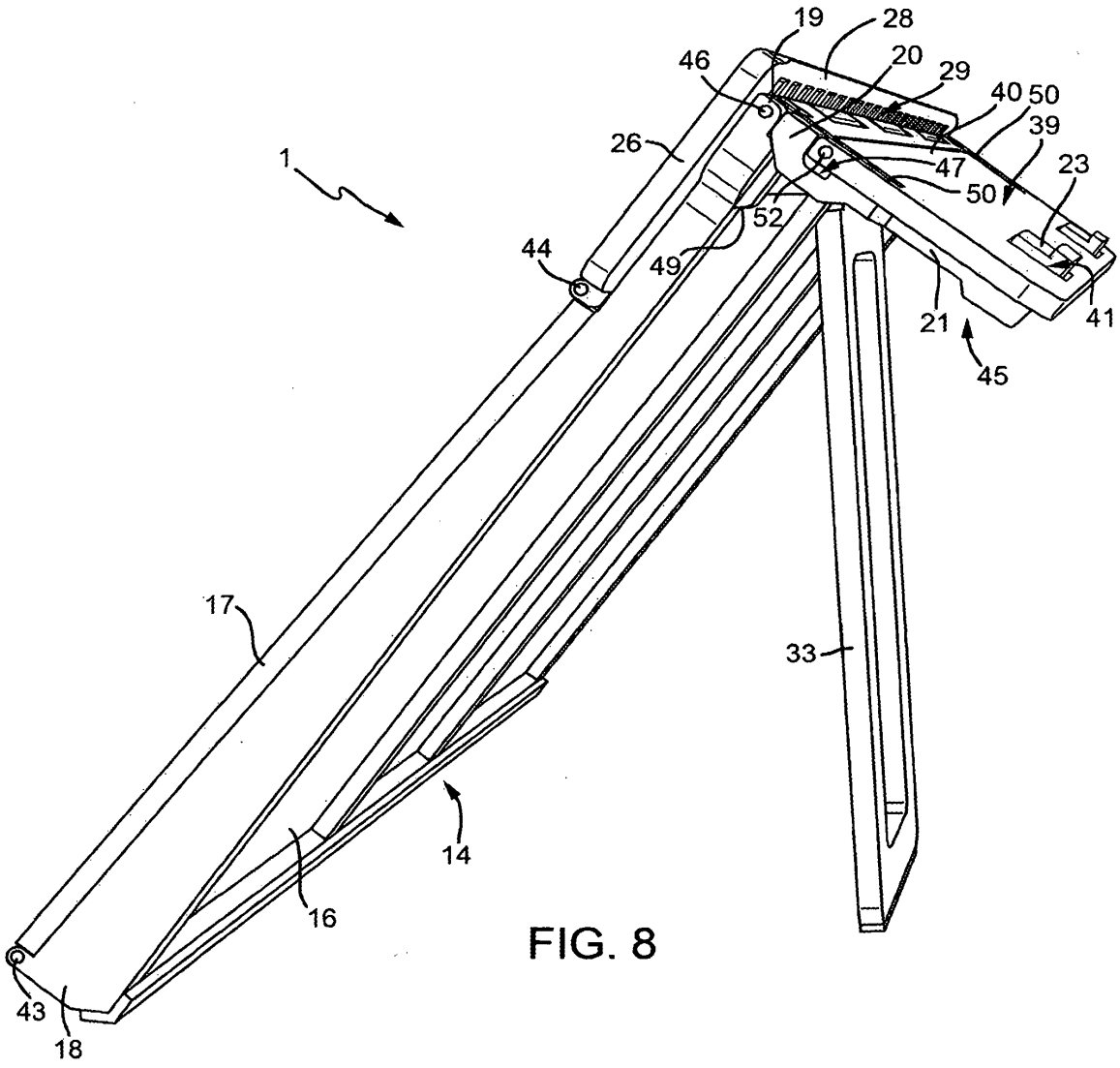

FIG. 8

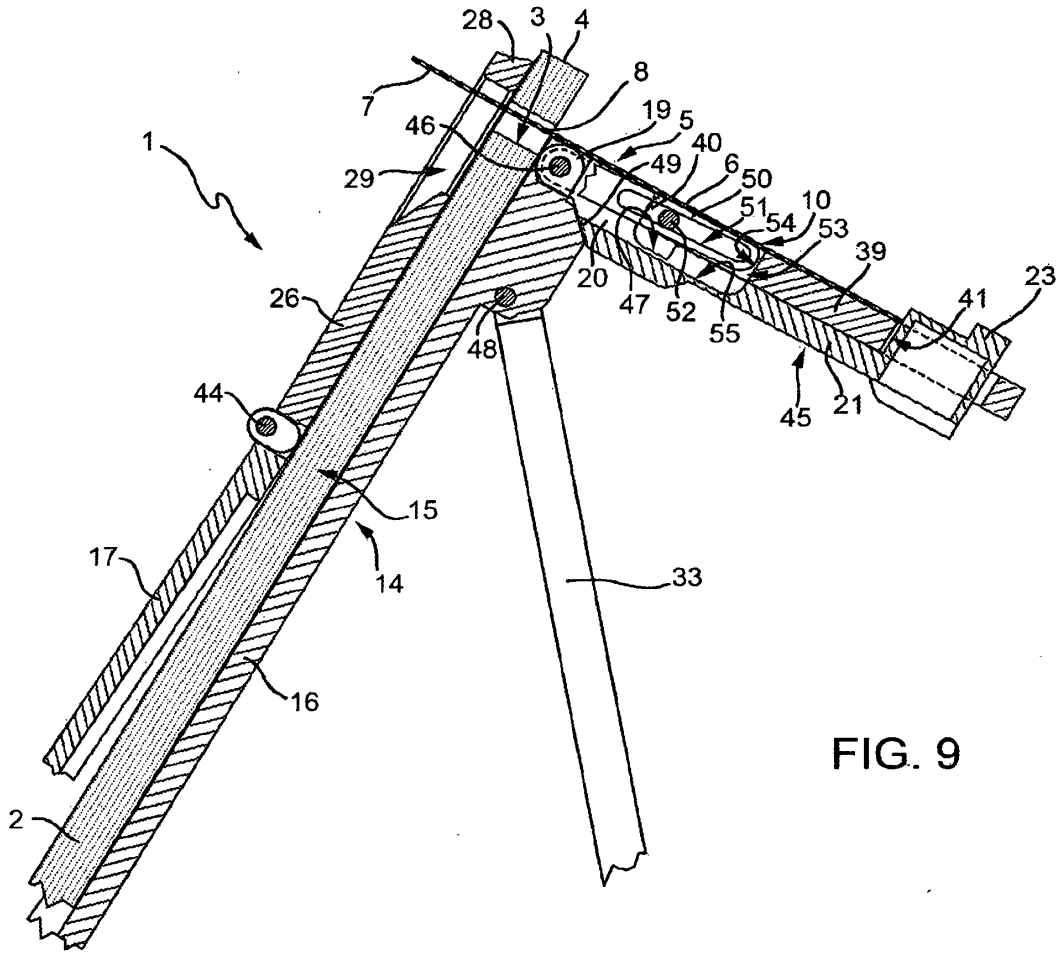
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FIG. 9

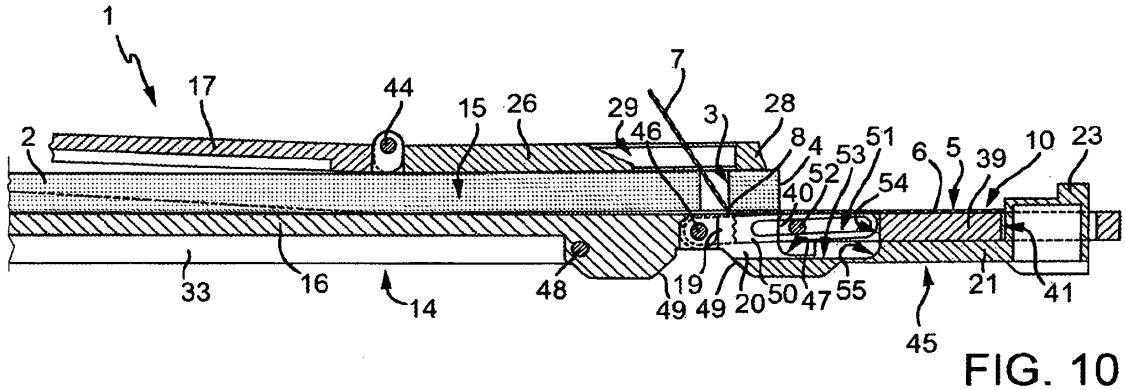
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FIG. 10

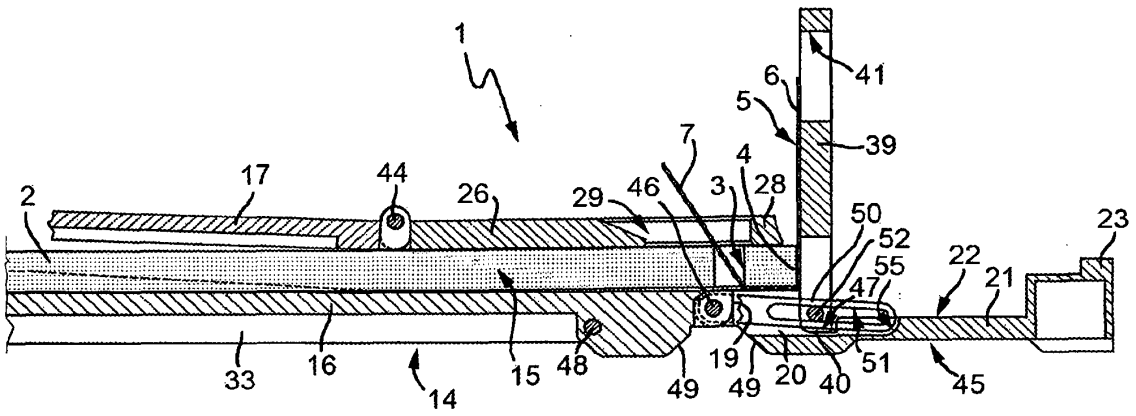

FIG. 11

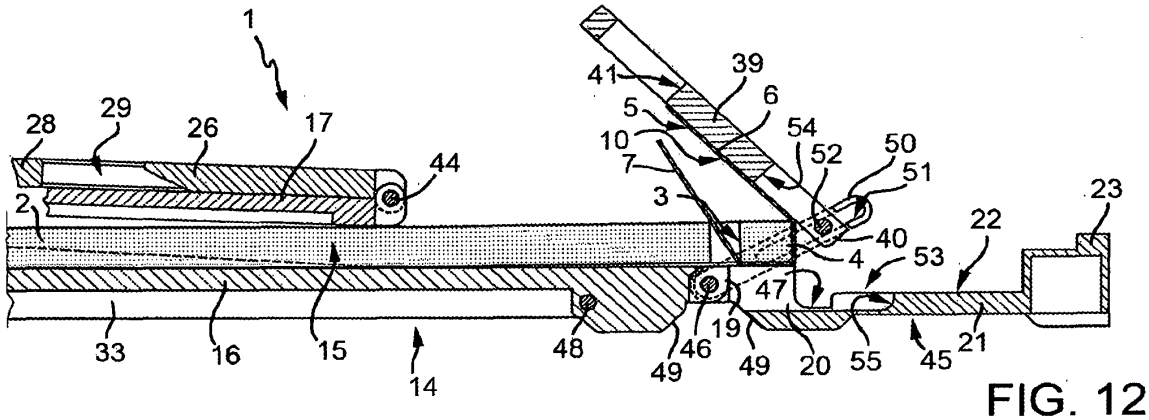

FIG. 12

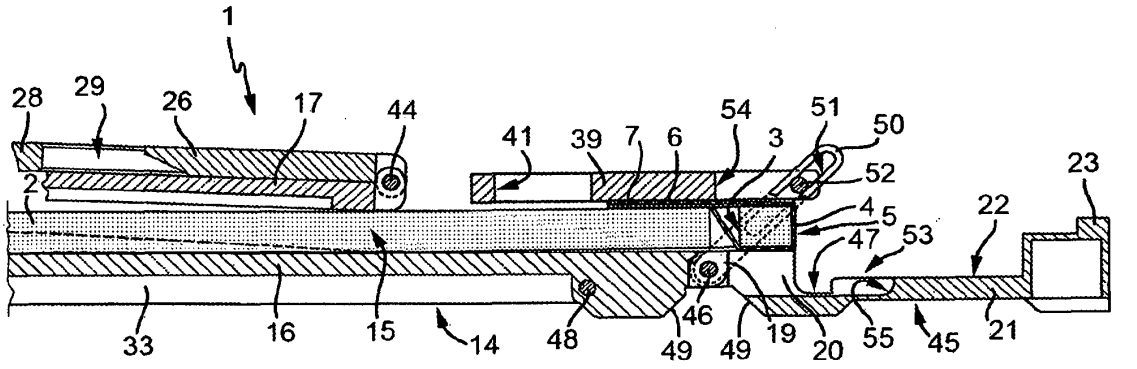

FIG. 13

REFERENCES CITED IN THE DESCRIPTION

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