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(54) STACKING UNIT OF SLATS ON A SUPPORT LADDER FOR THE PRODUCTION OF VENETIAN BLINDS AND METHOD OF STACKING SLATS ON A SUPPORT LADDER

(57) The invention concerns a unit for stacking slats on a support ladder, comprising: - means 20 to guide a slat L along a longitudinal insertion lane X on an insertion plane m; - means 30 for positioning a ladder on a positioning plane p incident to the insertion plane m at an area of engagement 2 with the slats; - means 40 for associating the slat to the ladder at the area of engagement 2; and a loader 50, placed above the insertion plane m, within which, one at a time, the slats are progressively pushed, juxtaposed to each other, after being associated to the ladder. The stacking unit comprises means 11, 12 for laterally containing the movements of each of the two uprights P1, P2 of the ladder between two vertical guide planes V1, V2 that extend parallel to the longitudinal insertion lane. Each of the two vertical guide planes V1, V2 extend laterally to the lane X near one of the two side edges X1, X2 of the same lane, externally thereto.

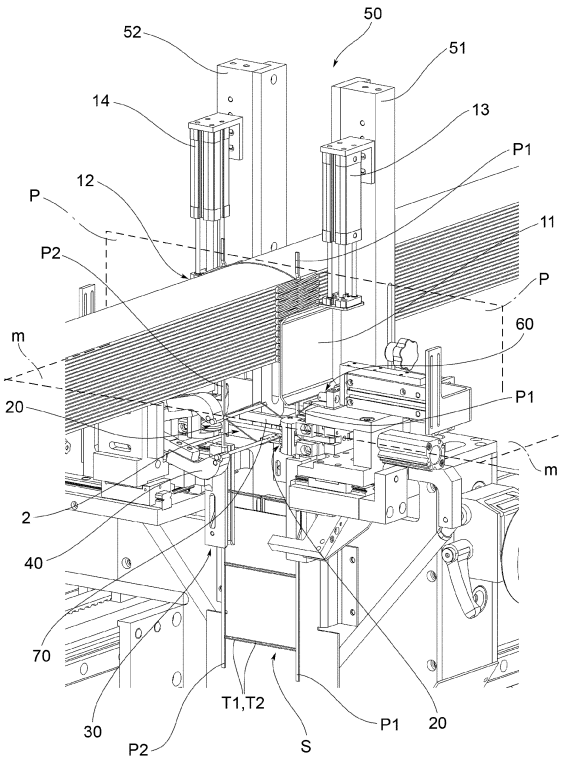

FIG.6

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Description

Application field

[0001] The object of the present invention is a unit for stacking slats on a support ladder for the production of Venetian blinds and a method of stacking slats on a support ladder.

State of the art

[0002] As is known, Venetian blinds are constituted by a plurality of slats, positioned parallel to each other and held in position by means of support structures made of string.

[0003] A first type of structure is called a "complete ladder", that is to say constituted by two parallel ribs (positioned in the height-wise direction of the blind, hereinafter called ladder "uprights") and by a plurality of cross-members which connect them to each other at regular intervals. A slat is associated to each cross-member, resting thereon (if the cross-member is single) or inserted therein (if the cross-member is multiple).

[0004] A second type of structure is called "separated ladders" or "half-ladder", that is to say, it is constituted by two cords separate from each other and each provided with a plurality of string eyelets distributed at regular distances along the single cord. The support cords are positioned in pairs at opposite sides of the slats, generally aligned transversally. The cords (hereinafter referred to as the "uprights" of the half-ladder) are associated to the slats at the eyelets by means of hooks fixed to the side edges thereof.

[0005] The assembly of the Venetian blinds with the supporting half-ladders is carried out in automated production lines, which comprise specific automated assembly stations, wherein the individual slats are associated to the complete ladders or supporting half-ladders and, thus associated, are progressively superposed one on the other to form the Venetian blind.

[0006] The automated assembly stations differ according to whether they are intended to assemble the slats on complete ladders or on half-ladders.

[0007] Regardless of the type of support ladder used, the assembly stations have a similar general structure. The assembly station in effect comprises a plurality of slat stacking units, which are aligned to each other along a slat insertion direction and operate simultaneously on the same slat. Each stacking unit is intended to associate to the slat being processed a complete ladder or a pair of half-ladders.

[0008] Operatively, the slats are inserted in sequence one by one along the aforesaid direction of insertion, passing through the individual stacking units. In the case of complete ladders, the single stacking unit is suitable to allow the insertion of the slat between the cross-members of the ladder, while in the case of half-ladders, the single stacking unit is suitable to fix the eyelet of each half-ladder to the edge of the slat. Once the slat has been associated to the support ladder (complete ladder or half-ladder) in each stacking unit of the assembly station, the single slat is raised together with the ladder to allow a new slat to be associated to the support ladder (at the subsequent cross-members or eyelets) and is carried in a so-called loader placed above the slat insertion zone. In the loader, the slats are superposed on each other in a compact configuration.

[0009] During this step of lifting into the loader, regardless of the type of support ladder used (complete ladder or half-ladder), the portions of the uprights between two pairs of cross-members or between two eyelets fold over themselves into a zigzag shape, which extends along an axis passing through the points of connection with the cross-members or eyelets. It is important that the uprights, folded in a zigzag pattern on themselves, remain completely outside the stack of slats arranged next to each other, without slipping between one slat and the other, as illustrated schematically in Figure 2, in the case of complete ladders. A similar situation also exists in the case of half-ladders. The external arrangement of the folded uprights is required both to ensure a correct operation of the Venetian blind and for aesthetic reasons. Generally, to facilitate and guide the zigzag folding of the uprights on themselves, the uprights have a thinning point in the cross-section, obtained halfway between two pairs of cross-members or between two eyelets, as illustrated in Figure 1.

[0010] However, it should be noted that during the lifting stage of the slats into the loader, it may happen that some portions of the uprights folded on themselves tend to be arranged transversely to the slats, pointing outwards from the pack of slats, as illustrated schematically in Figure 3. This incorrect rotation influences the positioning and folding of the lower portion. The upright in the process of being folded in effect makes a pivot in the area of connection to the cross-member or to the eyelet, tending to rotate in the opposite direction towards the inside of the slats, as illustrated schematically in Figure 3, thus placing itself between one slat and the other. At this point, such positioning error is reflected in cascade on the subsequent portions of the uprights, ruining the quality of the Venetian blind. In effect, this incorrect arrangement of the uprights, in addition to not allowing a correct superposition between the slats in the loader, may give a shape memory to the uprights, so that during use they will tend to resume that incorrect position, to the detriment of the functionality and aesthetics of the Venetian blind.

[0011] There is therefore a need in the field of the production of Venetian blinds to eliminate or at least significantly reduce the risk of placing the uprights between the slats during the production of Venetian blinds, in the step of arranging the slats next to each other in mutual superposition.

[0012] The units for stacking slats on ladders for the production of Venetian blinds known to date do not allow this requirement to be fully satisfied.

Presentation of the invention

[0013] Thus, the object of the present invention is to eliminate all or part of the drawbacks of the aforementioned prior art, by providing a unit for stacking slats on a support ladder for the production of Venetian blinds that allows one to significantly reduce the risk of positioning the uprights of the ladders between the slats when the slats are arranged next to each other in superposition.

[0014] A further object of the present invention is to provide a unit for stacking slats that is simple and economical to implement.

[0015] A further object of the present invention is to provide a method of stacking slats on a support ladder in a slat-stacking unit that allows the risk of the ladder uprights being positioned between the slats when the slats are arranged next to each other in superposition to be significantly reduced.

Brief description of the drawings

[0016] The technical features of the invention, according to the aforesaid objects, are clearly apparent from the content of the claims provided below and the advantages thereof will become more apparent in the following detailed description, made with reference to the accompanying drawings, which represent one or more purely illustrative and non-limiting embodiments thereof, wherein:

- Figure 1 shows a schematic perspective view of two slats of a Venetian blind connected together by complete ladders, illustrated in a separated condition;
- Figure 2 shows a schematic perspective view of some slats of a Venetian blind connected to each other by complete ladders, illustrated in a condition arranged next to each other with the uprights folded over on themselves and correctly placed;
- Figure 3 shows a schematic perspective view of the two slats in Figure 1 being arranged next to each other with the uprights assuming an incorrect position;
- Figure 4 shows a perspective view of a stacking unit according to a preferred embodiment of the present invention, illustrated with lateral containment means of the uprights in an active position;
- Figure 5 shows a perspective view of the stacking unit in Figure 4, illustrated with the lateral containment means of the uprights in a passive position;
- Figure 6 shows an enlargement of the stacking unit in Figure 4, illustrated in an operating step prior to the insertion of a slat, with the lateral containment means of the uprights already in an active position;
- Figure 7 shows the stacking unit in Figure 6, illustrated with the lateral containment means of the uprights already in a passive position;
- Figure 8 shows the stacking unit in Figure 7, illustrated after the insertion of a slat and with the lateral containment means of the uprights in a passive position; and
- Figure 9 shows a front orthogonal view of the stacking unit of Figure 4, according to the arrow IX shown therein.

Detailed description

[0017] With reference to the accompanying drawings, a unit for stacking slats on a support ladder for the production of Venetian blinds according to the invention has been indicated collectively at 1.

[0018] The support ladder may be either a complete ladder (as illustrated in the accompanying Figures) or a half-ladder. In both cases, the ladder S comprises two uprights P1, P2, which support a plurality of engagement elements with the slats T1, T2 arranged at regular distances between them along the longitudinal extension of the uprights. If the ladder is a complete ladder, the engagement elements with the slats T1, T2 are constituted by single cross-members or pairs of cross-members, as illustrated in the accompanying Figures. In the case wherein the ladder is a half-ladder, the engagement elements with the slats T1, T2 are constituted by eyelets. For the purposes of the invention, there is no difference between a complete ladder and a half-ladder, since what is of interest is the correct positioning of the uprights P1, P2, which are present in both cases and behave in the same way during the folding step.

[0019] The accompanying figures illustrate the particular case wherein the stacking unit is specifically configured for stacking slats on complete ladders. This reference should be understood merely by way of example, since the invention also extends to stacking units (not illustrated) configured specifically for stacking the slats on half-ladders.

[0020] In particular, the stacking unit 1 according to the invention is intended to be inserted - together with two or more identical units - in a more complex production plant (not illustrated in the figures). Unit 1 may be movably associated to a longitudinal support bar (not illustrated), at one end of which a slat production machine (not illustrated) is placed.

[0021] Here and in the description and claims that follow, reference will be made to the stacking unit in the condition of use. It is thus in this sense that references to a lower or upper position are to be understood.

[0022] According to a general embodiment of the invention, the stacking unit 1 comprises

- means 20 for guiding a slat L along a longitudinal insertion lane X on an insertion plane m;
- means 30 for positioning a ladder S on a positioning plane p incident to the insertion plane m at an area of engagement 2 with the slats;
- means 40 for associating the slat to the ladder S at the aforesaid area of engagement 2, acting on the engagement elements T1, T2; and

- a loader 50, placed above the insertion plane m, inside of which, one at a time, the slats are progressively pushed, juxtaposed to each other, after being associated to the ladder S.

[0023] In particular, as illustrated in the accompanying figures, the guide means 20 may consist of two grooved idle wheels at which the edges of the slats are slidably inserted. Advantageously, the guide means may assume different configurations, well known to a person skilled in the art. Therefore, these means will not be described here in greater detail.

[0024] Operatively, the aforesaid positioning means 30 are suitable for placing the ladder S with the two uprights P1, P2, spaced transversely from each other, on the two sides of the aforesaid longitudinal insertion lane X.

[0025] Such positioning means 30 are well known to a person skilled in the art, both whether they are configured to handle complete ladders, or whether they are configured to handle half-ladders. Therefore, such means will also not be described in greater detail here.

[0026] Also the means 40 for associating the slat to the ladder S at the aforesaid area of engagement 2 by acting on the aforesaid engagement elements T1, T2 are known per se to a person skilled in the art. Therefore, such means will also not be described in greater detail here.

[0027] Here we limit ourselves to observing that, in the case of complete ladders provided with double cross-members, the aforementioned means 40 for associating the slat to the ladder comprise devices for divaricating the pair of cross-members T1, T2 (as illustrated in the accompanying Figures) to allow the insertion of the slat in the inner space between them. These divaricating devices may be manufactured in different ways, as described for example in European patents EP3026208B1, EP2886781B1, EP2677108B1 and EP2677107B1 in the name of the same applicant, which are fully incorporated herein as a reference.

[0028] In the case of half-ladders, the aforesaid means 40 for associating the slat with the ladder comprise devices suitable for applying fixing rings to the edges of the slats and for permanently coupling the eyelets to these rings. In particular, such means may be made in accordance with European Patent EP 2653646 B1 in the name of the same applicant, which is incorporated herein in its entirety as a reference.

[0029] The slat loader 50 may be of any type suitable for the purpose. In particular, as illustrated in the accompanying Figures, the loader 50 consists of two bars 51,52 equipped with spring-loaded teeth 53 to support the slats already inserted in the ladder. The loader 50 is also well known per se to a person skilled in the art and will therefore not be described in greater detail.

[0030] Advantageously, as illustrated in the accompanying Figures, the stacking unit 1 further comprises means 70 for lifting the slat L from the insertion plane m to a higher position within the storage loader 50 of the slats already associated to the ladder. In the lifting movement, the slat drags the ladder S with it to the positioning plane p so as to bring another pair of engagement elements T1, T2 in proximity of the insertion plane m.

[0031] According to the invention, as illustrated in the accompanying Figures, the stacking unit 1 comprises means 11, 12 for laterally containing the movements of each of the two uprights P1, P2 of the ladder between two vertical guide planes V1, V2 that extend parallel to the aforesaid longitudinal insertion lane X.

[0032] As illustrated in particular in Figure 9, each of these two vertical guide planes V1, V2 extends laterally to the aforesaid lane X in proximity of one of the two side edges X1 or X2 of the lane itself, externally thereto.

[0033] In this way, as may be seen in particular in Figure 9, due to the aforesaid means of containment 11 and 12, the uprights P1 and P2 are prevented from being placed transversely to the lane X, externally thereto during their folding caused by the lifting of the slat into the loader 50. By preventing this, the risk of bent uprights P1 and P2 being arranged between one slat and another is significantly reduced.

[0034] Operatively, such containment means 11, 12 are thus suitable to guide the uprights P1, P2 to be placed parallel to the longitudinal edges of the slats L, as illustrated for example in Figure 2.

[0035] It is pointed out that each of these two vertical guide planes V1, V2 extends laterally to the aforesaid lane X near one of the two side edges X1 or X2 of the lane itself and not at these edges. In this way, a free space is created between each vertical guide plane V1, V2 and the relative side edge X1, X2 of the lane X, so that the uprights may move freely, without being hindered in their folding movements. In other words, the lateral containment means 11, 12 are configured not to crush the uprights against the slat, but only to prevent their transverse movements with respect thereto. In this sense, the vertical guide planes V1, V2 therefore extend in a position slightly distanced from the edges of the lane X (i.e. from the longitudinal edges of the slat inserted in the lane).

[0036] Preferably, as illustrated in Figure 9, each of these two vertical guide planes V1, V2 extends laterally to the lane X, externally thereto, at a distance D from the relative side edge X1, X2 of the same lane between 5 and 20 mm. Even more preferably, this distance D is between 10 and 15 mm.

[0037] Advantageously, as illustrated in the accompanying Figures, the aforesaid lateral containment means 11, 12 are suitable to act on the uprights P1, P2 above the insertion plane m at the aforesaid area of engagement 2 between the ladder and the slat. In other words, the action of the containment means 11, 12 may be limited to the area wherein the uprights P1, P2 are located, thus keeping the stacking unit 1 from unnecessarily invading other spaces.

[0038] Advantageously, the aforesaid lateral containment means 11, 12 are suitable to act on the uprights

P1, P2 at least in the height range immediately below the loader 50, corresponding to the section wherein the slat associated to the ladder has already been partially lifted from the insertion plane m and has not yet been inserted inside the loader 50. In other words, the lateral containment action exerted by containment means 11, 12 may be limited to the final stages of folding the uprights, possibly excluding the initial steps, when the uprights just begin to fold on themselves. In this way, the risk that these containment means may interfere in the engagement step of the slat with the ladder is reduced.

[0039] Preferably, as illustrated in particular in Figure 9, the aforesaid lateral containment means 11, 12 are suitable to operate on the uprights P1, P2 starting from a predefined height H from the insertion plane m between 30 and 100 mm, and preferably not less than 50 mm.

[0040] Preferably, the aforesaid lateral containment means 11, 12 are suitable to act on the uprights P1, P2 at least up to a height corresponding to a bottom of said loader 50, which in particular may be defined by the previously mentioned spring-loaded teeth 53 associated to the two bars 51 and 52 of the loader 50. When entering the loader 50, each slat L is initially positioned at the bottom of the same loader and is then replaced in this position by the next slat. When the slat L has reached this position, it is arranged substantially next to the slats already positioned at the top, and the uprights P1, P2 are already completely folded.

[0041] Preferably, as illustrated in the accompanying Figures, the aforesaid lateral containment means 11, 12 are suitable to act on the uprights P1, P2 beyond the height corresponding to the bottom of the loader 50, so that their action accompanies the folding of the uprights even after the completion thereof, thus ensuring a more effective and complete guidance and containment action.

[0042] According to the preferred embodiment illustrated in the accompanying figures, the aforesaid lateral containment means consist of two flat sheets 11, 12.

[0043] Each flat sheet 11 and 12 defines a main face facing the lane X and is positioned in such a way that the main face lies on one of the two vertical guide planes V1, V2.

[0044] Advantageously, as illustrated in the accompanying Figures, each of the two flat sheets 11, 12 may be connected to one of the two bars 51, 52 of the loader 50. Preferably, the loader 50 is placed downstream or upstream of the area of engagement 2 between the slats and ladder relative to a direction of insertion of the slat along the lane X. Thus, it is possible to attach the two flat sheets 11, 12 to the loader 50 in such a way that they are arranged above the area of engagement 2.

[0045] Advantageously, the stacking unit 1 may comprise on both sides of the aforesaid lane X automatic means 60 for cutting the uprights P1, P2 of the ladder at the aforesaid area of engagement 2 between the ladder and slat above the insertion plane m. In particular, such cutting means 60 may consist of shears placed on a carriage movable transversely to the lane X. Operatively, such means 60 intervene when the Venetian blind has been completed in its height extension and it is no longer necessary to associate other slats.

[0046] According to the preferred embodiment illustrated in the accompanying Figures, the aforesaid two flat sheets 11, 12 are movable upwards height-wise, preferably parallel to the respective vertical guide plane V1, V2, in particular by means of a respective actuator 13, 14 (consisting, for example, of a pneumatic cylinder). Operatively, the upward lifting of the two sheets 11, 12 is carried out in order to allow the aforesaid cutting means 60 to freely access the uprights P1, P2, without being hindered by the two sheets 11, 12.

[0047] In particular, each flat sheet 11, 12 may be moved between an active position, wherein it is arranged as close as possible to the insertion plane (near the area of engagement 2; as illustrated in Figures 4, 6 and 9), and a passive position, where it is placed as far away as possible from the insertion plane (as illustrated in Figures 5, 7 and 8).

[0048] According to an alternative embodiment (not illustrated in the accompanying Figures), the two flat sheets are fixed. Each of these two flat sheets, however, has a through opening through which the aforesaid cutting means may access the uprights. This solution, however, is not preferred, as it interrupts the lateral containment action of the sheets at the through opening.

[0049] The method of inserting slats on a ladder according to the invention will now be described.

[0050] The ladder consists of a complete ladder or a pair of half-ladders, and in both cases comprises two uprights P1, P2, which support a plurality of engagement elements with the slats T1, T2 placed at regular distances between them along the longitudinal extension of the uprights.

[0051] If the ladder is a complete ladder, the engagement elements with the slats T1, T2 are constituted by single cross-members or pairs of cross-members, as illustrated in the accompanying Figures. In the case wherein the ladder is a half-ladder, the engagement elements with the slats T1, T2 are constituted by eyelets.

[0052] As already said, for the purposes of the invention, there is no difference between a complete ladder and a half-ladder, since what is of interest is the correct positioning of the uprights P1 and P2, which are present in both cases and behave in the same way in the folding step.

[0053] According to a general implementation, the method comprises the following operating steps:

a) arranging a stacking unit 1 of slats L according to one or more of the preceding claims;

b) arranging a ladder S on the positioning plane p with the relative two uprights P1, P2 spaced transversely from each other on the two sides of said longitudinal insertion lane X;

c) inserting a slat L along the longitudinal insertion lane X attaching it to the ladder S;

d) lifting the slat L associated to the ladder S from the insertion plane m until it is brought inside the loader 3, juxtaposing it in superposition with any other slats already present in the loader and causing the folding of the uprights P1, P2 on themselves;

[0054] According to the invention, the method comprises a step e) for laterally containing the movements of the uprights P1, P2 during the aforesaid step d) of lifting by means of the aforesaid containment means 11, 12, so as to prevent the uprights P1, P2 - during their folding - from positioning themselves transversely to the lane X, externally thereto, guiding them to place themselves parallel to the longitudinal edges of the slats L, as illustrated for example in Figure 2.

[0055] The invention allows many advantages already partly described to be obtained.

[0056] The stacking unit 1 according to the invention significantly reduces the risk of the ladder uprights being positioned between slats when the slats are arranged next to each other in superposition. The lateral containment means in effect allow laterally containing the movements of the uprights P1 and P2 during the slat lifting step, preventing the uprights from being placed incorrectly, but guiding them to place themselves parallel to the longitudinal edges of the slats.

[0057] The slat stacking unit is simple and economical to make. No changes to the structure of traditional stacking units are in fact required.

[0058] The stacking unit 1 is also substantially simple to operate.

[0059] The slat stacking method according to the invention allows the risk of the ladder uprights being positioned between the slats when the slats are arranged next to each other in superimposition to be significantly reduced.

[0060] The invention thus conceived therefore achieves the foregoing objects.

[0061] Obviously, in its practical implementation, it may also be assumed to take on embodiments and configurations other than those illustrated above without departing from the present scope of protection.

[0062] Moreover, all details may be replaced by technically equivalent elements, and the dimensions, shapes and materials used may be of any kind according to the needs.

Claims

1. Stacking unit of slats on a support ladder for the production of Venetian blinds, wherein the ladder consists of a complete ladder or a pair of half-ladders, and in both cases comprises two uprights (P1, P2), which support a plurality of engagement elements with the slats (T1, T2) arranged at regular distances along the longitudinal extension of the uprights, wherein said stacking unit (1) comprises:

- means (20) for guiding a slat (L) along a longitudinal insertion lane (X) on an insertion plane (m);
- means (30) for positioning a ladder on a positioning plane (p)incident to said insertion plane (m) at an area of engagement (2) with the slats, said positioning means (30) being suitable to position the ladder with the two uprights (P1, P2) spaced from each other transversely, on the two sides of said longitudinal insertion lane (X);
- means (40) for associating the slat to said ladder at said area of engagement (2) by acting on said engagement elements (T1, T2); and
- a loader (50), placed above the insertion plane (m), inside of which, one at a time, the slats are progressively pushed, juxtaposed to each other, after being associated to the ladder,

characterized in that it comprises means (11, 12) for laterally containing the movements of each of the two uprights (P1, P2) of said ladder between two vertical guide planes (V1, V2) extending parallel to said longitudinal insertion lane (X), each of said two vertical guide planes (V1, V2) extending laterally to said lane (X) near one of the two side edges (X1, X2) of said lane, externally thereto.

2. Stacking unit according to claim 1, wherein each of said two vertical guide planes (VI, V2) extends laterally to said lane (X), externally thereto, at a distance (D) from the relative side edge of said lane of between 5 and 20 mm, preferably between 10 and 15 mm.

3. Stacking unit according to claim 1 or 2, wherein said lateral containment means (11, 12) are suitable to act on the uprights (P1, P2) above said insertion plane (m) at said area of engagement (2) between the ladder and slat.

4. Stacking unit according to claim 3, wherein said lateral containment means (11, 12) are suitable to act on the uprights (P1, P2) at least in the height range immediately below the loader (50), corresponding to the section in which the slat associated to said ladder has already been partially raised from the insertion plane (m) and has not yet been inserted inside the loader (50).

5. Stacking unit according to claim 3 or 4, wherein said lateral containment means (11, 12) are suitable to act on the uprights (P1, P2) starting from a predefined height (H) from said insertion plane (m) between 30 and 100 mm, and preferably not less than 50 mm.

6. Stacking unit according to one or more of claims 3 to 5, wherein said lateral containment means (11,

12) are suitable to act on the uprights (P1, P2) at least up to a height corresponding to a bottom of said loader (50).

7. Stacking unit according to one or more of the preceding claims, wherein said lateral containment means consist of two flat sheets (11, 12), each of which defines a main face facing the lane (X) and is positioned in such a way that said main face lies on one of said two vertical guide planes (V1, V2).

8. Stacking unit according to claim 7, wherein said unit (1) comprises on both sides of said lane (X) means (60) for cutting the uprights (P1, P2) of the ladder at said area of engagement (2) between the ladder and slat above said insertion plane (m) and wherein said two flat sheets (11, 12) are movable in height upwards, preferably parallel to the respective vertical guide plane (V1, V2), to allow said cutting means (60) to freely access the uprights (P1, P2).

9. Stacking unit according to claim 7, wherein said unit (1) comprises on both sides of said lane (X) means (60) for cutting the uprights (P1, P2) of the ladder at said area of engagement (2) between the ladder and the slat above said insertion plane (m) and wherein each of said two flat sheets (11, 12) is provided with a through opening through which said cutting means (60) may access the uprights (P1, P2).

10. Method of stacking slats on a ladder for the production of Venetian blinds, wherein the ladder consists of a complete ladder or a pair of half-ladders, and in both cases comprises two uprights (P1, P2), which support a plurality of engagement elements with the slats (T1, T2) placed at regular distances along the longitudinal extension of the uprights, the method comprising the following operating steps:

- a) arranging a stacking unit (1) of slats (L) according to one or more of the preceding claims;
- b) arranging a ladder (S) on the positioning plane (p) with the relative two uprights (P1, P2) spaced from each other transversely on the two sides of said longitudinal insertion lane (X)
- c) inserting a slat (L) along said longitudinal insertion lane (X) associating it to the ladder;
- d) lifting the slat associated to the ladder from said insertion plane (m) until it is brought inside said loader (3), juxtaposing it in superposition with any other slats already present in the loader and causing the uprights (P1, P2) to fold on themselves;

characterized in that it comprises a step e) of laterally containing the movements of the uprights (P1, P2) during said lifting step d) by means of said containment means (11, 12), so as to prevent the uprights (P1, P2) - during their folding - from positioning themselves transversely to said lane (X), externally thereto, guiding them to place themselves parallel to the longitudinal edges of the slats (L).

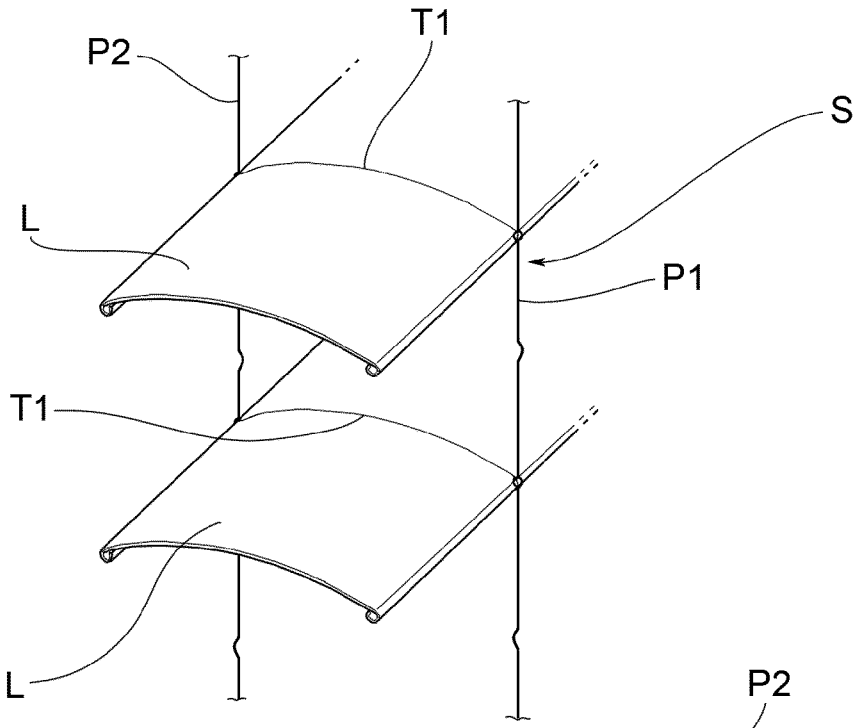


FIG.1

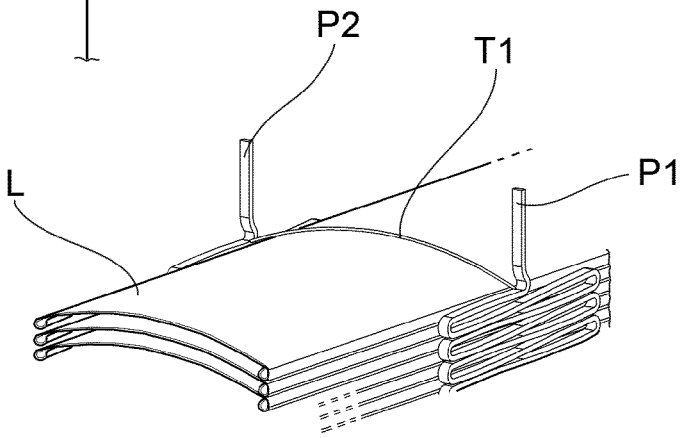


FIG.2

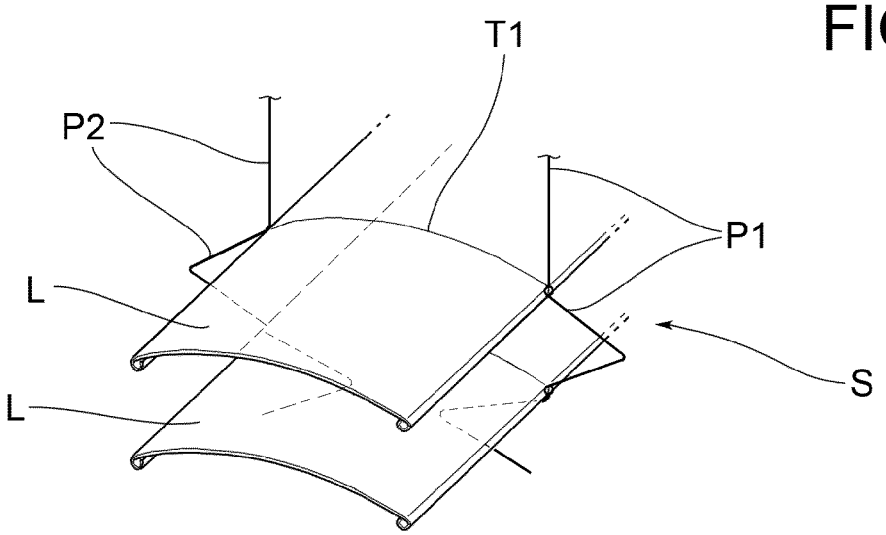


FIG.3

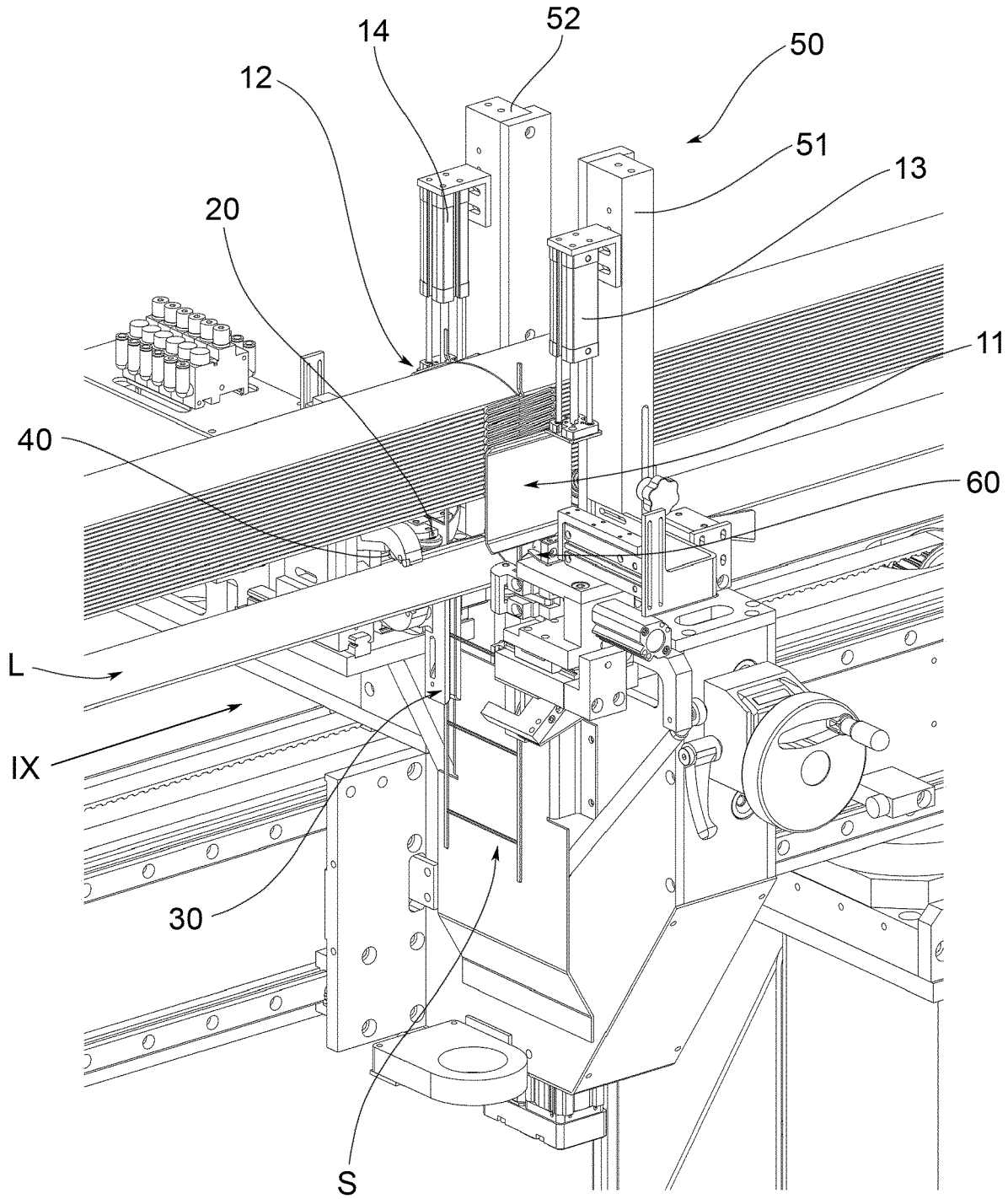


FIG.4

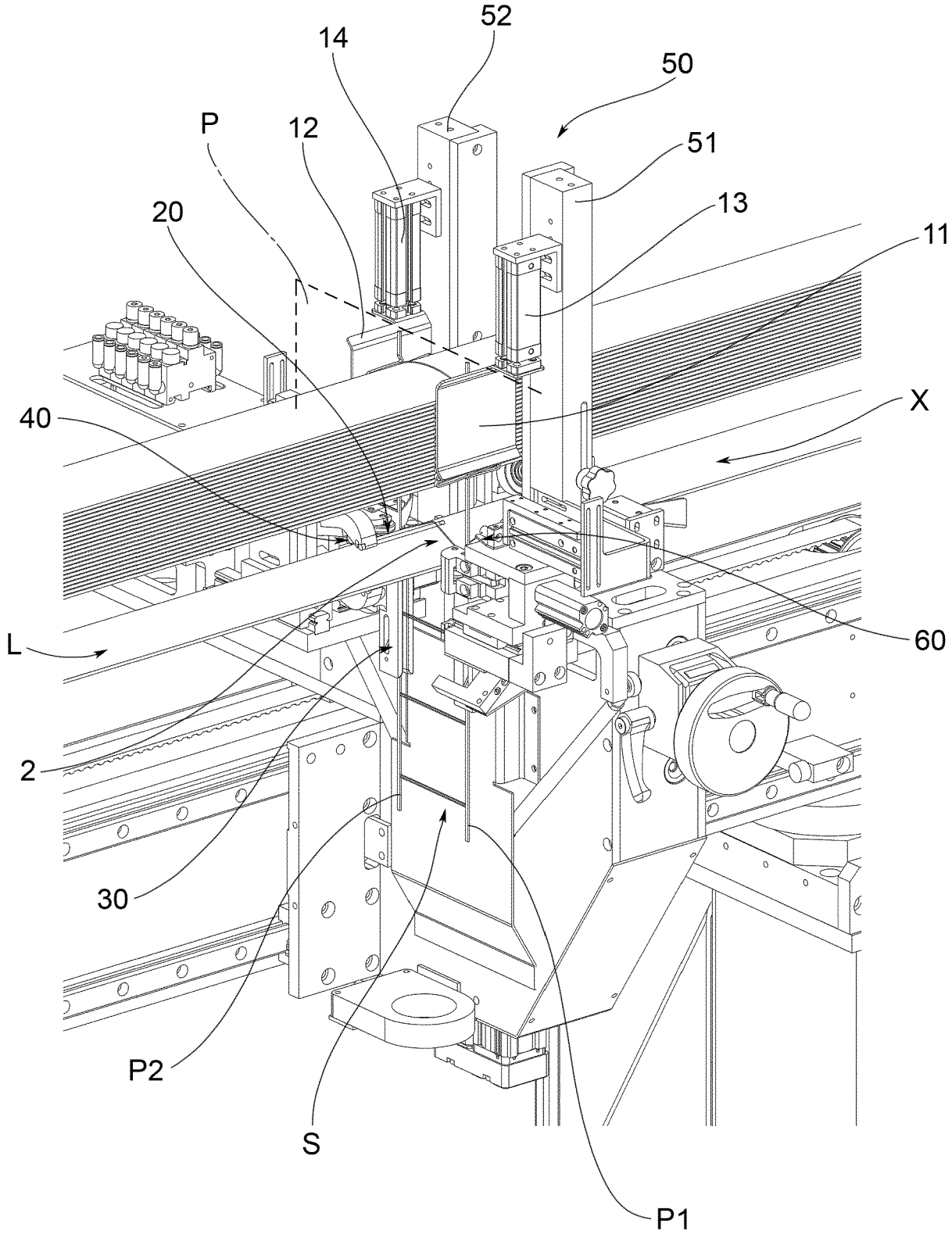


FIG.5

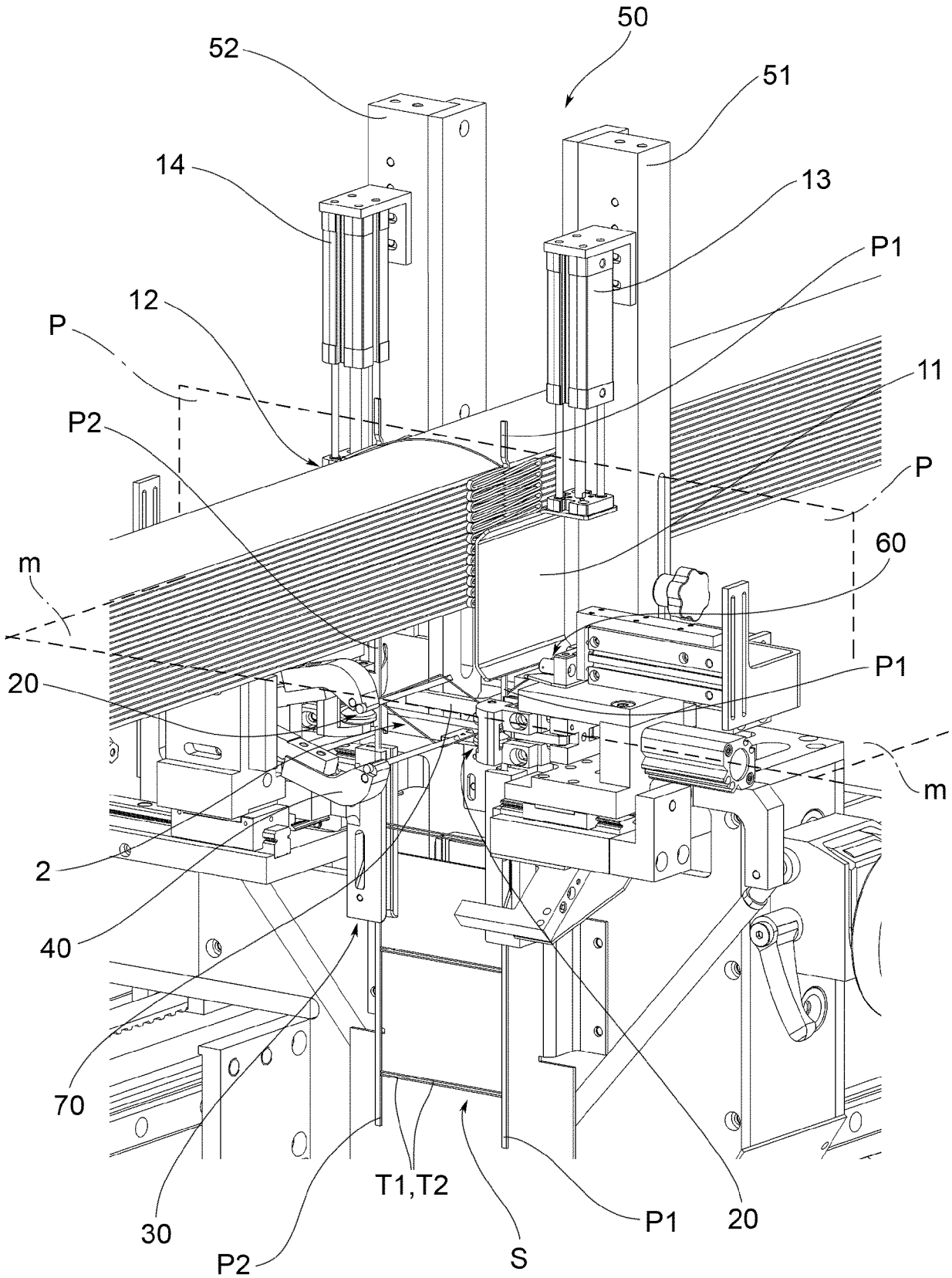


FIG.6

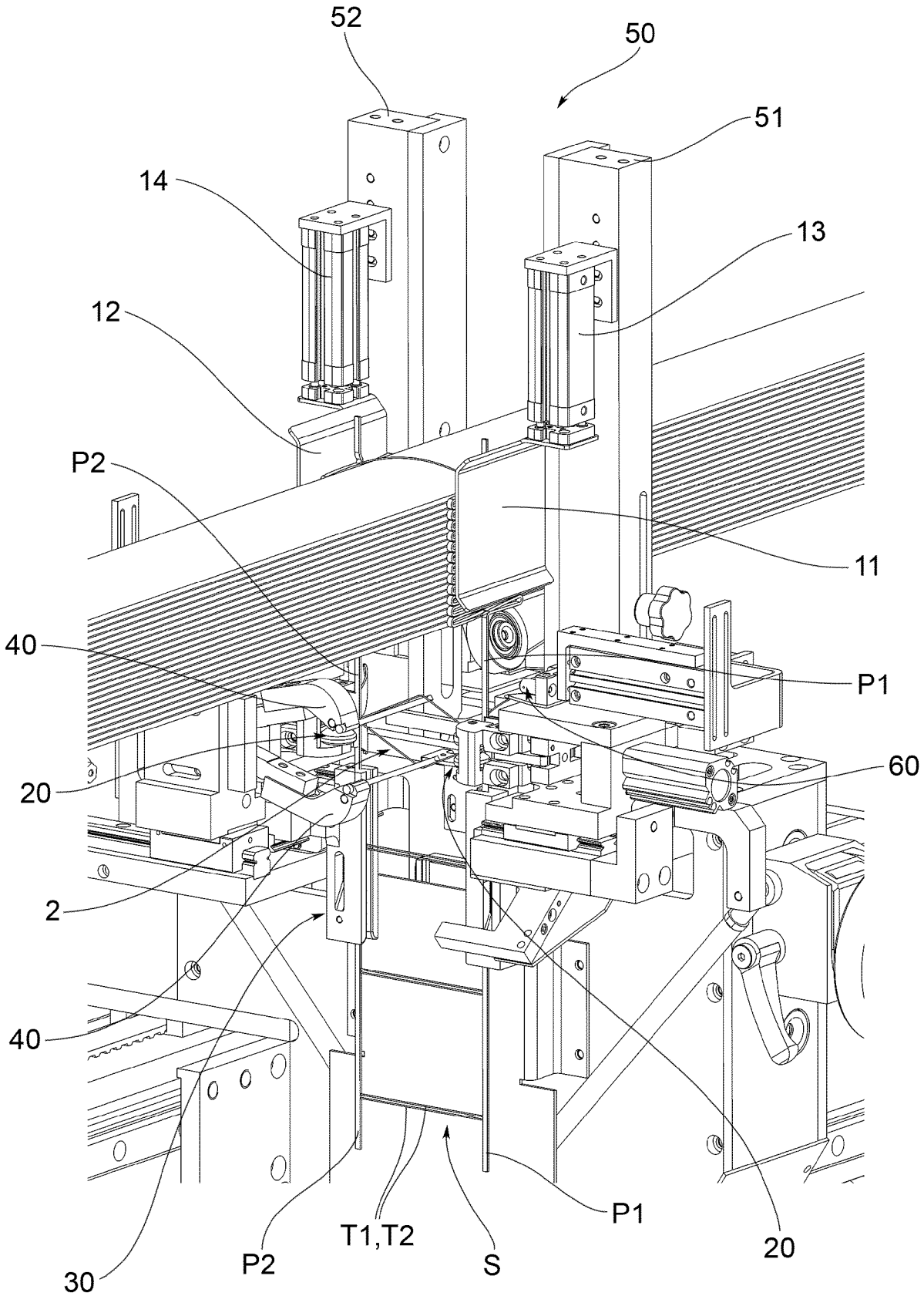


FIG.7

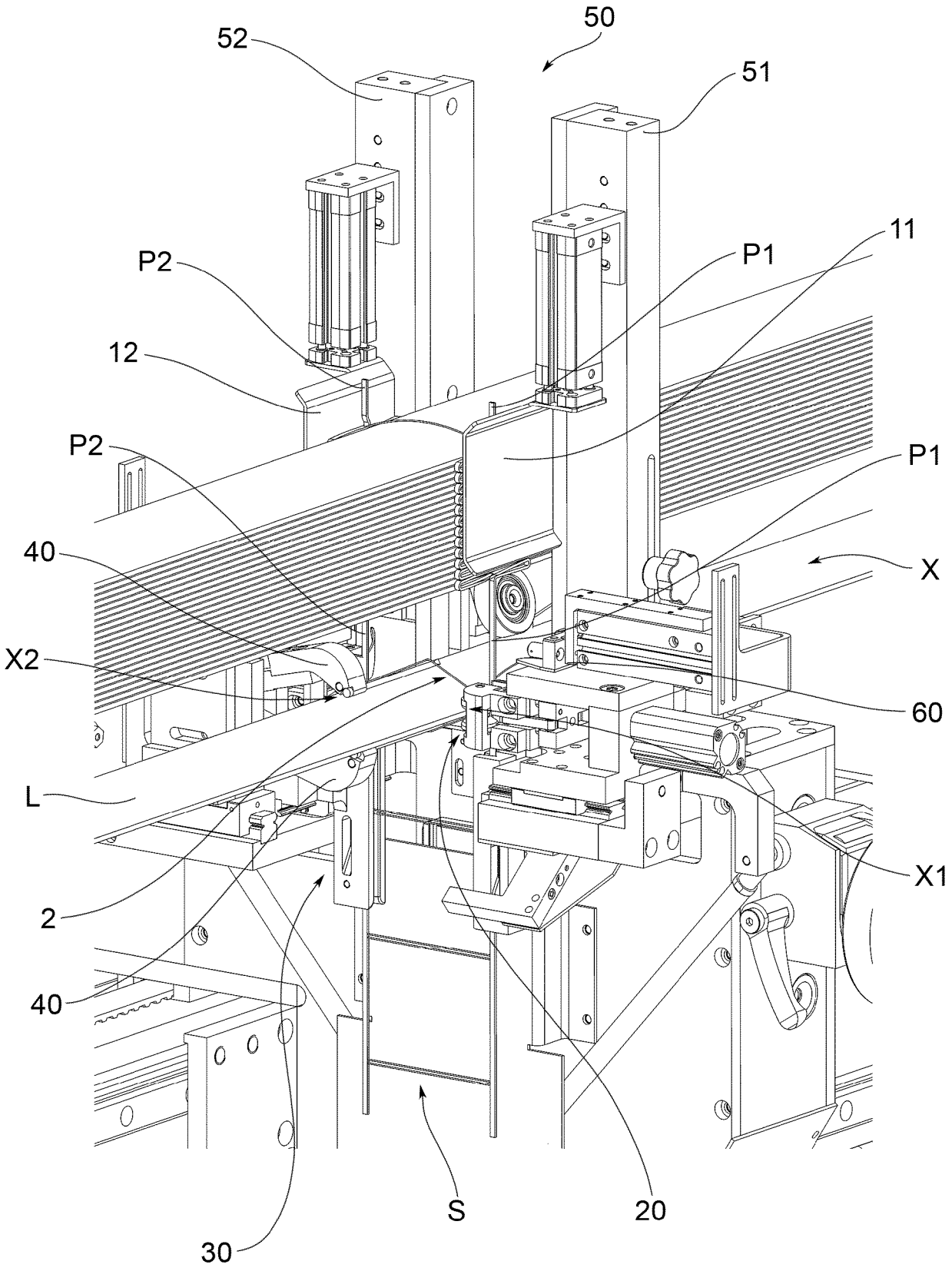
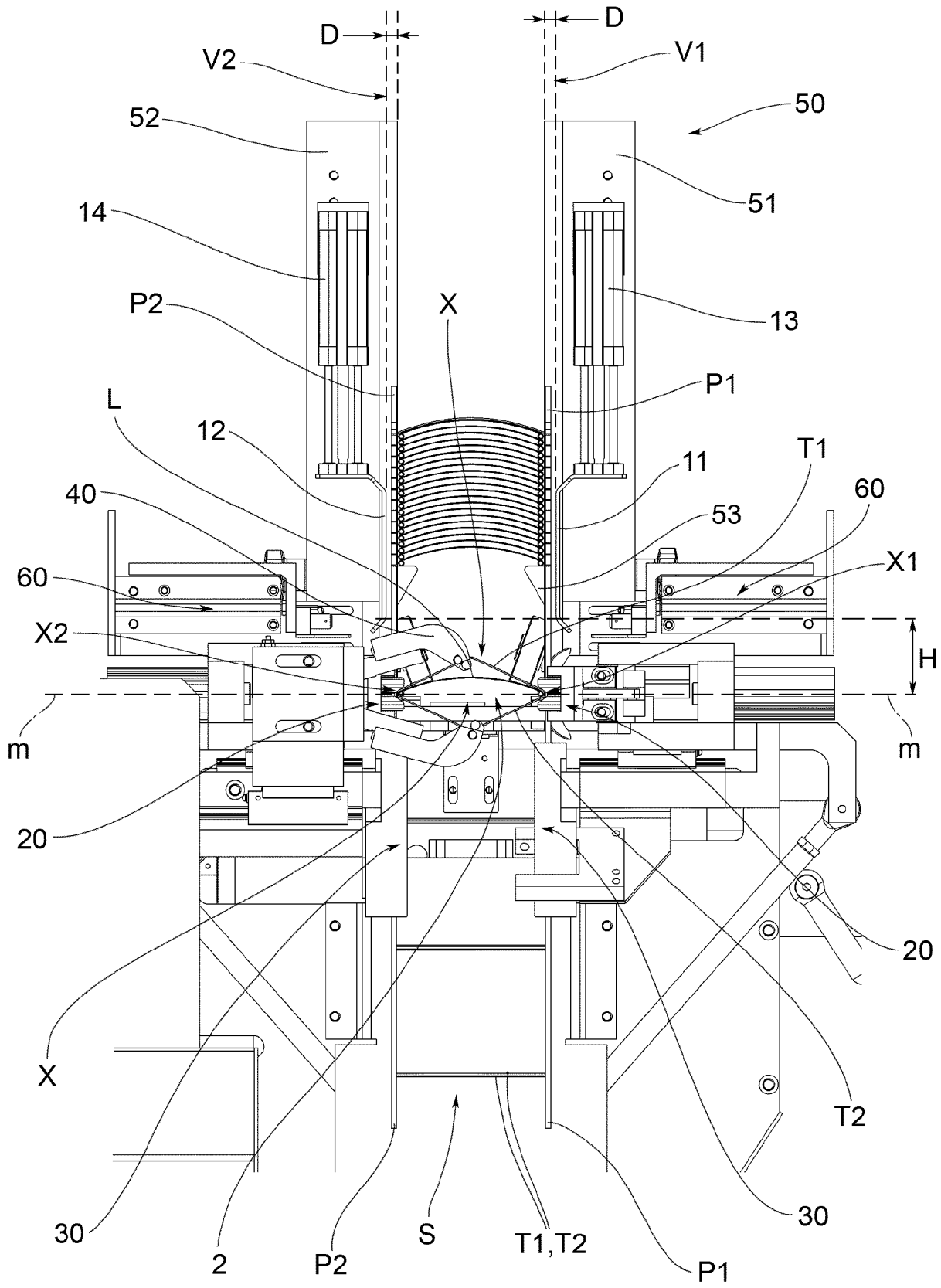


FIG.8


D
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X2
H
m
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S
T1,T2
P1

FIG.9

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EUROPEAN SEARCH REPORT

Application Number
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A	* figures 1,8 * * paragraphs [0025], [0027], [0028], [0029], [0031], [0053] *	7-10	
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Place of search	Date of completion of the search	Examiner
Munich	13 September 2019	Tänzler, Ansgar

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