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(54) **Apparatus for shaping trays from blank sheets**

(57) An apparatus for making edged trays (9'') from blank sheets (9,9'), of the type comprising a stationary store (2) for a plurality of these stacked blank sheets (4), a first moving member (6) for at least one (9) of these sheets, one or more tray-forming walls (5a,5b,5c) being arranged substantially at the store outlet section, and being movable between an at least partially closed position and an opened position of said store outlet section, as

well as at least one storage station (12) for the tray. Said first moving member is movable according to a rectilinear reciprocating motion between a take-up position of at least one blank sheet, within the store, and a position of releasing the tray at the storage station, and further this first moving member, in the rectilinear reciprocating motion thereof, also acts as a pusher for forcedly inserting the sheet into the forming walls.

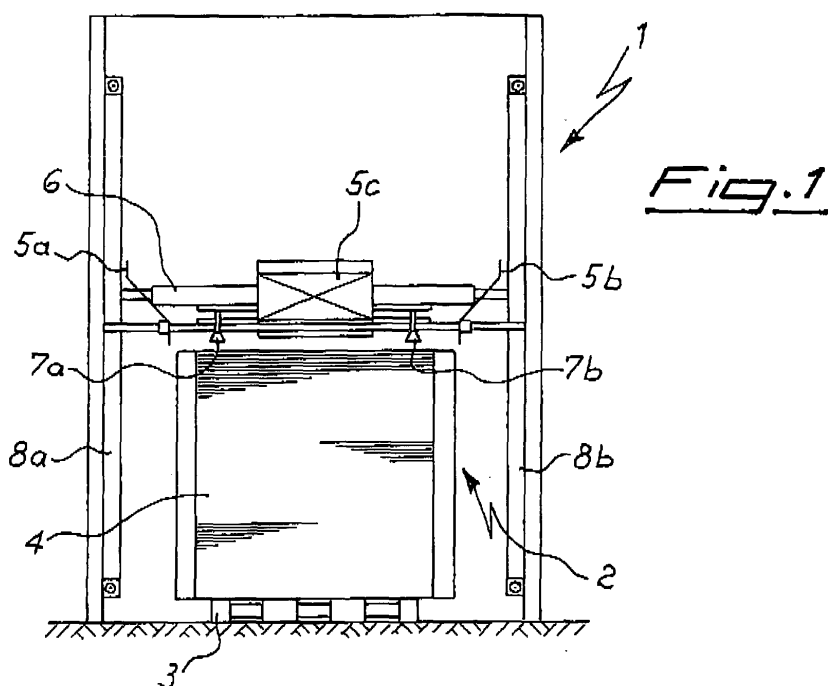


Fig. 1

Description

[0001] The present invention relates to an apparatus for forming edged trays from blank sheets (i.e. die-cut sheets), preferably made of cardboard, of the type comprising a store for a stack of blank sheets, a first moving member for at least one sheet to be processed and a plurality of forming walls within which the sheet is forcedly inserted, such as to obtain said edged tray, by means of folding suitable flaps and tabs of the sheet.

[0002] It is known in the art to make edged trays, such as suitable for holding bottles or other containers, from cardboard blank sheets, which, after they exit from the die-cutting press, are stacked in a preferably horizontally or vertically developing store, taken from here by means of a suitable moving member, and thus placed at a plurality of forming walls that are shaped such as to form in the blank sheet those folds as defined by the previously made creasing lines, which are required for making an edged tray. After the blank sheet has been placed at these forming walls, a suitable pusher, or punch, forces the blank sheet into the space being defined by these walls, thus causing the flaps and tabs thereof - which are defined by said creasing lines - to fold and making, at least partially, the tray. At the end of this operation, which is, similar to an drawing operation, a second moving member takes up the tray, which has been formed by means of the above-mentioned forming walls and punch thereof, and brings it to a storage station, where said tray can be taken up for further use, or where forming auxiliary means, if provided, provide to, for example, close the tray with glue or staples, or however finishing it, depending on what has been provided during the design step.

[0003] GB 2,023,548, issued to NUTRO, describes a similar apparatus, wherein a vertically developed store of stacked blank sheets is placed on the side of an "drawing" area of blank sheets, which consists of a plurality of walls defining a forming frame for a tray. The apparatus provides a first moving member for the stacked blank sheets that, by being translatable along two perpendicular axes, has the function of taking up, by means of suction grippers or a suction system, a sheet from the stack being the store and then bringing the taken-up sheet and releasing the latter above the forming frame.

[0004] Here, the blank sheet, which is initially rested on the walls constituting the forming frame, is forcedly pushed into the latter by a suitable punch, such as to provide on the blank sheet, by plastic (i.e. permanent) deformation, the folds required for obtaining the tray.

[0005] An auxiliary apparatus provided with further moving means thereof, if provided, can be arranged downstream of the forming frame in order to take up the formed tray and place the latter in a special storage station.

[0006] CA 2,110,766, issued to Zinzius, describes an apparatus similar to that described in GB 2,023,548, wherein the store for stacked blank sheets is arranged on a side of a tray-forming device, and wherein said de-

vice is of the type comprising a plurality of forming walls and a punch, or pusher, being suitable to force the blank sheet into said forming walls. Taking-up the sheets to be sent to the processing from the store of stacked sheets and shifting the same into the forming device is relied to a transportation member being placed under the store and substantially consisting of a conveyor belt. Another conveyor belt, placed downstream of the forming walls, has further the function of bringing the tray to a storage station.

[0007] The apparatus described in GB 2,023,548 and CA 2,110,766, though being quite effective, has two drawbacks: the excessive plan overall dimensions and the provision of three or more moving member for the blank sheet and tray, which may be a possible source of malfunctioning for the apparatus.

[0008] Particularly, as relates to the plan overall dimensions of this apparatus, this dimensions are known to be reduced by arranging the store of stacked sheets, usually according to a vertical development, which store can advantageously consist of a simple stack of these sheets, on-line with the forming walls, and the punch thereof, if provided, which are in this case arranged immediately downstream of the sheet store outlet section. The possibility of moving said forming walls close to and away from each other allows the sheet being processed to enter from the store to the forming area, when these walls are away from each other, and the subsequent forming operation is allowed either by these walls moving close to each other about the blank sheet, or by means of the punch action when the forming walls have been moved again close to each other.

[0009] It should be observed that, even in the case of vertical forming apparatus, a first moving member is known to be provided for moving the sheet to be processed from the store to the forming walls, a punch, if provided, and a further grip member for carrying the tray to a storage station.

[0010] Accordingly, as relates to the provision of at least three different members and actuators suitable for translating the blank sheet and tray, it should be pointed out that prior art apparatus does not resolve the problems connected with an excessive number of these actuators, i.e. the fact that they bring a certain complexity in the apparatus structure, the requirement of frequent and laborious maintenance operations, and a consequent increase in the probability of failure of the entire apparatus.

[0011] It is accordingly an object of the present invention to provide an apparatus for forming edged trays from blank sheets that does not have the drawback of the prior art, and thus has a simplified structure and accordingly allows reducing the number of actuators to be employed.

[0012] Another object of the present invention is to provide an apparatus for making edged trays that does not have excessive plan overall dimensions and is also simple to use.

[0013] A further object of the present invention is to provide a method for operating said apparatus, which

allows making edged trays from blank sheets in an effective and rapid manner.

[0014] These and other objects are achieved by means of the apparatus for making edged trays from blank sheets according to the first independent apparatus claim and subsequent dependent claims, and the fifteenth independent method claim and subsequent dependent claims.

[0015] The apparatus for making edged trays from blank sheets, according to the present invention, comprises a stationary store for a plurality of stacked blank sheets, a first moving member for at least one of these sheets, one or more tray-forming walls being arranged substantially at the store outlet section, and being movable between an at least partially closed position and an opened position of the store outlet section, as well as at least one storage station for the tray. This first moving member is movable according to a rectilinear reciprocating motion between a take-up position of, within the store, at least one sheet, and a tray release position at the above-mentioned storage station. This first moving member is, in the rectilinear reciprocating motion thereof, also a pusher for forcedly inserting the sheet into the forming walls.

[0016] Using an individual movable member for taking, transporting and also forming, with the aid of forming walls, both the blank sheet being processed from the stacked blank sheets store, and (after it has been formed) the tray, allows the forming apparatus to be considerably simplified, which accordingly results to be more reliable, easier and more rapid to use and also more cost-effective as compared with similar apparatus known in the art.

[0017] Furthermore, the fact that this movable member, in order to carry out what has been described above, requires an actuator that allows the same to be translated in only one direction, allows further simplifying the kinematics required, with clear advantages in terms of structural simplification and lower costs.

[0018] In a preferred embodiment of the apparatus according to the present invention, the store of stacked blank sheets is placed immediately under said forming walls, the storage station is arranged above the forming walls and the first moving member translates along a vertical straight line. Thereby, the apparatus has a generally vertical development, with reduced plan overall dimensions.

[0019] According to a preferred aspect of the present invention, this first moving member, which preferably comprises sheet-holding means by means of fluidic suction, is shaped such that the travel thereof is controlled by a suitable control logic and extends between a position coincident with the store bottom wall, i.e. that wall opposite said outlet section for blank sheets, and a position corresponding to the storage station for the tray being formed.

[0020] As the travel of the first moving member can be changed in a controlled manner, the apparatus is provided with a considerable flexibility of use, and any further

actuator for the blank sheets or formed tray is accordingly unnecessary.

[0021] According to another aspect of the present invention, the apparatus forming walls are synchronized by means of a suitable control logic, with the reciprocating translation of said first moving member, such that these walls are automatically opened relative to each other in order to allow this first moving member to enter the blank sheet store, and then re-closed to block the store outlet section while defining the tray forming area when the first forming member is going to forcedly push the blank sheet to be processed between these walls.

[0022] According to another aspect of the present invention, a method is provided for making edged trays from blank sheets in an apparatus comprising a stationary store for a plurality of these blank sheets being stacked on each other, one or more tray forming walls, which are placed substantially at the store outlet section, and being movable between an at least partially closed position and an opened position for this outlet section, a first moving member for at least one of the sheets stacked within the store, wherein this first moving member is movable at least according to a reciprocating rectilinear movement, and also acts as a pusher for forcedly inserting the blank sheet being processed within said forming walls, as well as at least one storage station for the tray. This method comprises the following steps of:

1. moving the forming walls to an open position of the store outlet section for the blank sheets ;
2. moving within the store the first moving member via the outlet section thereof to a position of taking at least one sheet;
3. taking and transporting, through this outlet section, at least one blank sheet to reach said forming walls;
4. moving the forming walls to an at least partially closed position of the store outlet section, in a mutual arrangement that preferably defines the forming and/or centering region of the blank sheet;
5. forcedly moving the sheet being processed, which is held by the first moving member within the forming walls for making an edged tray ;
6. moving said tray being still held by the first moving member to reach a storage station;
7. releasing the tray in the storage station thereof.

[0023] As will be understood below, the execution of the method described above, in an apparatus according to the present invention, allows edged trays to be easily and rapidly manufactured from blank sheets.

[0024] A particular embodiment of an apparatus, and a method for providing an edged tray will be now described by way of nonlimiting example, according to a preferred aspect of the present invention, with reference to the annexed figures, in which:

- Fig. 1 is a side schematic view of an apparatus for forming trays from a blank sheet, according to a par-

- tical aspect of the present invention, which is depicted during a step of taking up a blank sheet;
- Fig. 2 is a side schematic view of the apparatus in Fig. 1 during a step of centering the blank sheet prior to forming the latter;
 - Fig. 3 is a side schematic view of the apparatus in Fig. 1 and 2, which is shown during the step of forming the tray;
 - Fig. 4 is a side schematic view of the apparatus in the preceding figures, which is illustrated during a step of transporting the tray to a storage station (not shown);
 - Fig. 5 is a side schematic view of the apparatus in the preceding figures, which is depicted during a step of releasing the tray to a storage station;
 - Fig. 6 is a plan view of a blank sheet for use with an apparatus according to the present invention; and
 - Fig. 7 is a perspective view of an edged tray that can be obtained by means of an apparatus according to the present invention.

[0025] Referring first to Fig. 6 and 7, the apparatus 1 according to the present invention has the purpose of forming, at least only by means of folding, a edged tray 9" from a blank sheet 9', that is preferably made of card-board. This tray 9" can be intended for containing bottles or other containers made of ceramic or glass.

[0026] The blank sheet 9', according to the prior art, is suitably cut and shaped in a die-cutting press (not shown) such that the outer shape and creasing lines 16 define a base portion 13 of the finished tray 9", flaps 14, suitable to become the side edges of the tray 9", and tabs 15 arranged to become the corners of these side edges of the tray 9". The mechanical folding of the flaps 14 and tabs 15 about the creasing lines 16 thereof, relative to the base portion 13 of the blank sheet 9', results in a tray 9", though not provided with fixing elements, such as staples or glue, that are suitable for holding the tray 9" in the desired shape. The apparatus for making edged trays 9", according to the present invention has the function of making at least this folding of flaps 14 and tabs 15 of the blank sheets 9', and only optionally providing the same with said fixing elements.

[0027] With general reference now to Fig. 1-5, a particular embodiment will be described below of an apparatus 1 for forming edged trays from a blank sheet 9, 9' according to the present invention.

[0028] This apparatus 1 comprises a store 2 for a plurality of blank sheets 9, 9' arranged in a stack 4, a first member 6 for moving at least one blank sheet 9, which is reciprocating movable at least in a predefined direction, a plurality of forming walls 5a, 5b 5c arranged above the outlet section of store 2 and also movable in an at least one predetermined direction either to allow or prevent the blank sheets 9 to pass from the stack 4 to the store 2 and in order to define at least one forming region for the blank sheet 9, 9', i.e. a delimited space where, when the sheet is forced therein, the flaps and tabs of the blank

sheet 9, 9' are folded in order to provide the edged tray 9".

[0029] The apparatus 1 further comprises a storage station 12 (see Fig. 5) for the formed trays, which may be provided with a second moving member 10 for these trays.

[0030] As may be seen in the figures, the particular embodiment of the apparatus 1 as described herein has a substantially vertical development, and has the store 2, the forming walls 5a, 5b, 5c and the storage station, respectively, being placed upon each other.

[0031] It should be noted that this vertical development, that is particularly advantageous in order to reduce the plan overall dimensions of the apparatus 1, is not required to the purposes of the present invention, since the apparatus 1 can be also manufactured according to a horizontal development.

[0032] According to the present invention, said first member 6 for moving at least one blank sheet 9 of the apparatus 1 is translatable movable in a rectilinear direction of movement between a take-up position, within the store 2, of at least one blank sheet 9, and a position of releasing the tray at the storage station 12. Furthermore, during the rectilinear travel thereof, the moving member 6 acts also as a pusher for forcedly inserting the blank sheet 9 within the forming walls 5a, 5b, 5c, after they have been re-closed by moving close to each other, such as to define said forming region for the blank sheet 9.

[0033] As stated above, using an individual moving member, 6 which acts both as a transportation element for the blank sheet 9, prior to forming, and for the edged tray, after forming, and as a pusher, or punch, for providing the tray, is found to be particularly advantageous since it allows simplifying the structure of the apparatus 1, as the number of actuators required for operation is reduced.

[0034] The member 6 can preferably comprise a plurality of suction grippers or cups 7a, 7b fluidically connected to a suction system, which are suitable to hold, by means of depression, one of the blank sheets 9, and which are mounted on a movable cross-beam, which is slidably fastened to side rectilinear guides 8a, 8b, which are parallel to each other and arranged on the sides of this movable cross-beam.

[0035] Due to the vertical development of the apparatus 1 illustrated herein, the member 6 substantially translates in a vertical direction and consequently the side guides 8a, 8b are vertically directed.

[0036] The operation of the member 6 in the vertical translation thereof can be relied to pneumatic means, such as a hydraulic jack, or electric motors, such as direct current (DC) brushless motors, that are controlled by a suitable control logic (not shown) which allows the precise adjustment of the movement, and hence the travel, of this first moving member 6. Particularly, the shape of member 6 and the control logic thereof, as well as the optional provision of sensors suitable for detecting the size of the stack 4 or the distance between the member 6 and the last blank sheet 9 in the stack, can allow the

member 6 to reach the bottom (i.e. lower) wall of the store 2, such as to be capable of easily taking up and moving all the blank sheets 9 being in the stack 4 as the dimensions of the latter are changed.

[0037] In the particular embodiment of the apparatus as illustrated herein, the store 2 simply consists of a pallet 3 on which a plurality of blank sheets 9 are placed horizontal onto each other, such as to provide a stack 4 extending in the vertical direction.

[0038] The forming walls 5a, 5b, 5c placed in the apparatus 1 immediately above the outlet section of store 2, as stated above, can be translated in reciprocating manner in a horizontal direction, due to actuators and controllers (not shown), such as to be capable of clearing the outlet section of store 2 (see Fig. 1) or to be capable of defining, by blocking this outlet section, said forming area (see Fig. 2-5).

[0039] The movement of the forming walls 5a, 5b, 5c, which may not be obviously necessarily rectilinear in a horizontal direction and is also a function of the geometry of the apparatus 1, can be preferably controlled in a synchronized manner with the translation of said first member 6 for moving the blank sheets 9. Thereby, the member 6 can rapidly enter the store 2, with the walls 5a, 5b, 5c being in the mutual opening position, and the blank sheet 9 can be as rapidly forced into the forming area, with the walls 5a, 5b, 5c in the position of moving close to each other.

[0040] These walls 5a, 5b, 5c, which can be ideally arranged along the periphery of the tray to be formed, are suitably S-shaped, such as to have a vertical upper face that is arranged for centering the blank sheet 9 prior to forming, an inwardly inclined face that acts as the folding guide for the flaps and table of the blank sheet 9, and a last vertical lower face that finally defines the folding required to make the edges of the tray.

[0041] The number and arrangement of the forming walls 5a, 5b, 5c in the apparatus 1 are known to be given by the geometrical characteristics of the starting blank sheet and tray desired to be obtained.

[0042] Similar shapes of the forming walls 5a, 5b, 5c are also described, for example, in the above cited Canadian Patent CA 2,110,766.

[0043] According to a particular aspect of the apparatus 1, as described herein, the forming walls 5a, 5b, 5c not only can be translated in a rectilinear direction, but they can be also pivoted about axes transversal to said rectilinear direction, such that different faces can be presented to the sheet 9 being processed, such as shown in Fig. 2, in order to center the sheet 9 prior to forming the latter.

[0044] Particularly, the forming walls 5a, 5b, 5c, which are for example also driven by brushless DC electric motors, can be translatably and rotatably controlled by suitable means (not shown) to move the blank sheet 9 being processed relative to said forming area, i.e. to center the sheet 9 relative to the configuration achieved by the walls 5a, 5b, 5c when the latter are arranged in their mutual

tray-forming position.

[0045] According to a preferred aspect of the present invention, the apparatus 1 provides that the first member 6 moving the blank sheets 9 is not only translatable in a rectilinear direction, but also rotatably operable, for example by means of brushless motors, about an axis that can either coincide with, or be incident to the rectilinear direction of translation thereof. This possible rotation of the member 6, preferably about an axis orthogonal to the direction of translation, has the purpose of allowing the release of the tray 9, at the storage station 12. Particularly, in the apparatus 1 as shown in the figures, the member 6 is pivoted about a horizontal axis in order to allow the tray 9 to be released to said second moving member 10 of the storage station 12 by being rotated by 180° relative to the configuration thereof upon forming.

[0046] Finally, the second moving member 10 for the tray 9, which is provided in said storage station 12, can also comprise suction grippers or fluidic suction means 11a, 11b to hold, for example at the edges thereof, the tray 9 and transporting the latter by being variously arranged and oriented as a function of the requirements of the apparatus using the tray downstream of the apparatus 1.

[0047] It should be observed that, as it is known in the art, the apparatus 1 can also comprise auxiliary means (not shown) for folding and/or fixing, such as by means of stapling or gluing the tabs and flaps of the blank sheet 9, auxiliary means that can be arranged for example at the forming walls 5a, 5b, 5c or downstream of the second moving member 10, within the storage station 12.

[0048] Furthermore, all the actuators of the apparatus 1, as it is common in the art, can be controlled by a suitable control logic, for example implemented by means of a PLC or electronic processor (also not shown).

[0049] The operation of the apparatus 1 described above, which is a particular embodiment of the method for making edged trays according to the present invention, will be now illustrated with reference to Fig. 1-5.

[0050] After the store 2 has been filled with a set of blank sheets, such as of the type 9' depicted in Fig. 6, that are arranged in a stack 4 on a pallet 3, the apparatus 1 provides, preferably by means of suitable sensors and a control logic therefor, a first moving step (or mutual departure) of the forming walls 5a, 5b, 5c, in the outward horizontal direction of the apparatus 1 (as may be seen in Fig. 1), in order to clear the outlet section of the store 2 and thus allowing a blank sheet 9 to be taken up by the member 6.

[0051] When the walls 5a, 5b, 5c are moved away from each other, such that the outlet section of store 2 is cleared, the member 6 can translate in the direction of the store 2, along the guides 8a, 8b, and be arranged, also in this case by means of sensors, if provided, at the uppermost blank sheet 9 in the stack 4. As may be seen in Fig. 1, in this position, when the fluidic suction system is operated, the member 6 can take up and hold the uppermost blank sheet 9 provided in the stack 4 within store

2 by means of the cups 7a, 7b.

[0052] Subsequent to this step of taking up the blank sheet 9, there is a step of transporting the blank sheet 9, by means of the member 6 upwards translation, from the store 2, through said outlet section, to reach the forming walls 5a, 5b, 5c. Then, the latter are, preferably in a syn-

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synchronized manner with the translation of the member 6, re-closed relative to each other in order to block the outlet section of the store 2 and to define a frame on which the blank sheet 9 can be rested.

[0053] In a simplified embodiment of the method for carrying out the present invention, said step of closing the walls 5a, 5b, 5c is such as to directly define a forming area for the blank sheet 9, i.e. these walls 5a, 5b, 5c are immediately arranged in their final position, in which the edged tray is obtained by the blank sheet 9 being forcedly inserted therein. The blank sheet 9 can be also centered prior to being formed due to shape thereof and said arrangement of the walls 5a, 5b, 5c, or by auxiliary means being optionally provided.

[0054] In a preferred embodiment of the method according to the present invention, however, the walls 5a, 5b, 5c, or at least one or more thereof, following the step of transporting the blank sheet 9 outside the store 2, can be rotated and translated in a controlled manner, such as to be a centering matrix for the blank sheet 9 being processed, such as shown in Fig. 2.

[0055] When the walls 5a, 5b, 5c have achieved this centering arrangement for the blank sheet 9, the preferred embodiment of the method according to the present invention provides that the moving member 6, after the latter has reached a higher position relative to the walls 5a, 5b, 5c, temporarily releases the blank sheet 9, thus allowing the latter to drop on the walls 5a, 5b, 5c thereby facilitating the initial centering thereof relative to said forming area.

[0056] When the blank sheet 9 is unfastened from the cups 7a, 7b of the suction means of the member 6, between the forming walls 5a, 5b, 5c, any further controlled movements, either rotational or translational, of these walls 5a, 5b, 5c can allow a precise centering for the blank sheet 9 being processed.

[0057] After this centering step, the member 6 preferably takes up again the (now centered) blank sheet 9, and lifts the latter relative to the walls 5a, 5b, 5c, which are then induced to be arranged such as to define said forming area, i.e. they are translated and rotated such as to be arranged, relative to each other, according to what is provided for the subsequent forming step, wherein the flaps and tabs of the blank sheet 9 must be folded by the engagement with these walls 5a, 5b, 5c.

[0058] As shown in Fig. 3, after the walls 5a, 5b, 5c have reached their forming position, by moving close to each other, the moving member 6, by holding the blank sheet 9 by means of the cups 7a, 7b of the suction means, is translated again to the store 2, such as to forcedly push the blank sheet 9 through the walls 5a, 5b, 5c, and thus provide the edged tray by folding said flaps and tabs of

the blank sheet 9, about the creasing lines thereof.

[0059] At the end of the forming step, possibly following a translation of the walls 5a, 5b, 5c moving away from each other, the moving member 6, still holding the tray 9, translates away from the walls 5a, 5b, 5c to the storage station 12, where a final step of releasing the just-formed tray is provided.

[0060] As illustrated in Fig. 4 and 5, prior to the step of releasing the tray 9, a further step of rotating the tray 9 is provided, which is carried out by means of the rotation of the member 6 about an axis perpendicular to the direction of translation thereof, which allows presenting the latter, in the proper configuration thereof, to the second moving member 10 of the storage station 12 (see Fig. 4 and 5).

[0061] At the end of this possible rotation step of tray 9, a release step (Fig. 5), of the tray 9 at station 12 is finally provided, and thus the subsequent repetition of the method described above for forming further trays.

Claims

1. An apparatus (1) for making edged trays (9") from blank sheets (9, 9'), of the type comprising a stationary store (2) for a plurality of said stacked blank sheets (4), a first moving member (6) for at least one (9) of said sheets, one or more tray-forming walls (5a, 5b, 5c) that are arranged substantially at the outlet section of said store and movable between an at least partially closed position and an opened position of said outlet section of said store, as well as at least one storage station (12) for the tray, **characterized in that** said first moving member is movable according to a rectilinear reciprocating motion between a position of taking-up at least one blank sheet, within said store, and a position of releasing the tray at said storage station, said first moving member, in the rectilinear reciprocating motion thereof, also being a pusher for forcedly inserting said sheet into said forming walls.
2. The apparatus according to claim 1, **characterized in that** said one or more forming walls are placed either above or below said outlet section of said store and said release station is placed above or below said one or more forming walls, respectively.
3. The apparatus according to claim 2, **characterized in that** said first moving member is movable according to a rectilinear reciprocating motion along a substantially vertical straight line.
4. The apparatus according to any preceding claim, **characterized in that** the travel of said first moving member, during said rectilinear reciprocating motion, can be changed in a controllable manner.

5. The apparatus according to claim 4, wherein said travel variably extends between a position substantially coincident with the bottom wall of said store, and said tray-releasing position. 5
6. The apparatus according to any preceding claim, **characterized in that** said first moving member is also rotatably movable about an axis coincident with, or incident to the straight line along which said first moving member moves according to a rectilinear reciprocating motion. 10
7. The apparatus according to any preceding claim, **characterized in that** said axis about which said first moving member is rotatably movable is substantially orthogonal to the straight line along which said first moving member moves according to a rectilinear reciprocating motion. 15
8. The apparatus according to claim 3 and 7, **characterized in that** said first moving member is rotatably movable about a substantially horizontal axis. 20
9. The apparatus according to any preceding claim, **characterized in that** said first moving member comprises suction gripper and/or fluidic suction means (7a, 7b) for holding said at least one sheet. 25
10. The apparatus according to any preceding claim, **characterized in that** said storage station comprises at least one second moving member (10) for said edged tray. 30
11. The apparatus according to claim 10, **characterized in that** said at least one second moving member is provided with suction gripper (11 a, 11b) and/or fluidic suction means for holding said tray. 35
12. The apparatus according to any preceding claim, **characterized in that** it comprises means for synchronizing the displacement of said forming walls with said rectilinear reciprocating motion of said first moving member. 40
13. The apparatus according to any preceding claim, **characterized in that** it comprises means for centering the sheet being processed through the controlled movement of said forming walls. 45
14. The apparatus according to any preceding claim, **characterized in that** it comprises auxiliary means for folding and/or fixing flaps and/or tabs of said blank sheet being processed. 50
15. A method for realizing edged trays from blank sheets in an apparatus of the type comprising a stationary store for a plurality of said sheets being stacked on each other, a first moving member for at least one of said stacked sheets, said first moving member being movable at least according to one rectilinear reciprocating motion, one or more forming walls of the tray, which are substantially placed at the outlet section for the sheets of said store and movable between an at least partially closed position and an opened position of said outlet section of said store, and wherein said first moving member acts as a pusher for forcedly inserting said sheet into said forming walls, as well as at least one storage station for the tray, **characterized by** the steps of:
 1. moving said forming walls to said opened position of the outlet section of said store;
 2. moving said first moving member, within said store, through said outlet section thereof, to a position of taking up at least one sheet;
 3. taking up and transporting, through said outlet section, said at least one sheet at said forming walls;
 4. moving said forming walls to said at least partially closed position of the outlet section of said store;
 5. moving said at least one sheet, which is held by said first moving member, within said forming walls for making said edged tray ;
 6. moving said tray being held by the said first moving member to reach said storage station;
 7. releasing said tray in said storage station.
16. The method according to claim 15, wherein said first moving member is also rotatably movable about an axis coincident with, or incident to the straight line along which said first moving member is movable according to a rectilinear reciprocating motion, the method comprising a step of rotating the tray prior to said step of releasing said tray in the storage station.
17. The method according to claim 15 or 16, **characterized in that** it comprises a step of centering said at least one sheet being processed relative to said forming walls by means of relative movement of one or more of said forming walls relative to said at least one sheet, or vice versa, prior to said step of moving said at least one sheet being held by said first moving member within said forming walls.
18. The method according to claim 17, wherein said centering step comprises the step of temporarily releasing said at least one sheet being processed, by said first moving member, to be rested within said forming walls.
19. The method according to claim 18, wherein said centering step provides, immediately after said temporary release step, a step of moving said forming walls for centering said at least one sheet.

20. The method according to claim 18 or 19, wherein said centering step comprises a final take-up step, by said first moving member, of said at least one sheet being processed.

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21. The method according to any claim 17 to 20, wherein said forming walls are moved to adopt a different shape for said centering step and said step of moving said at least one sheet being held by said first moving member, within said forming walls.

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22. The method according to any claim 15 to 21, wherein the travel of said first moving member, in the rectilinear reciprocating motion thereof, is variable and controlled.

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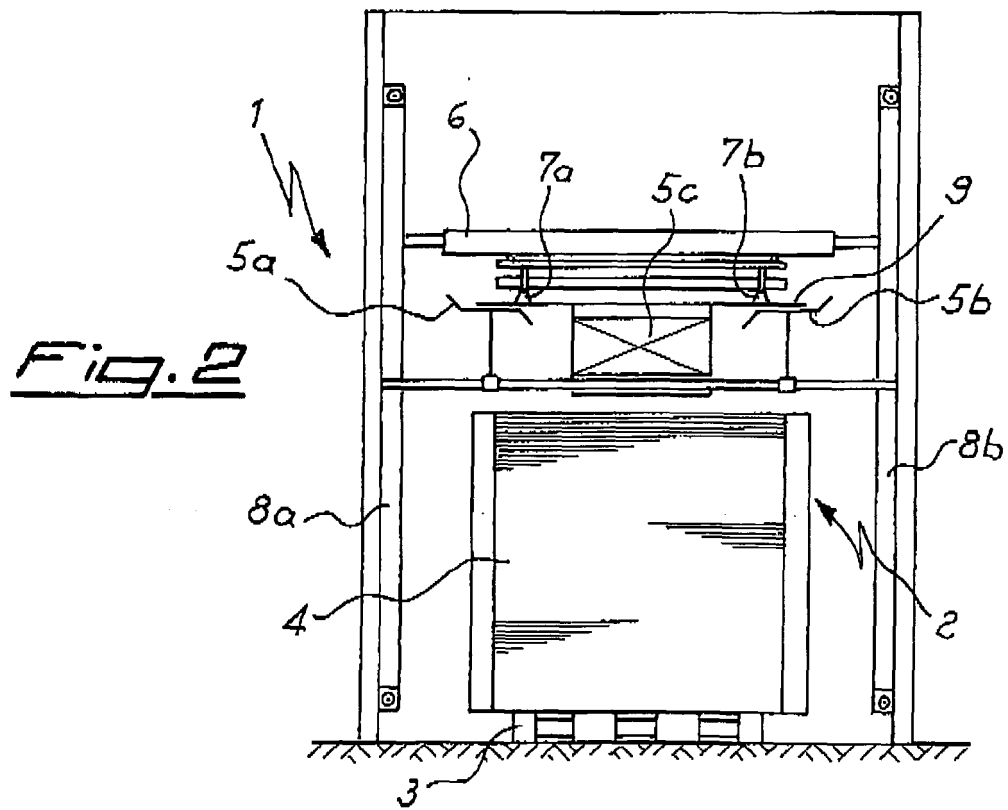
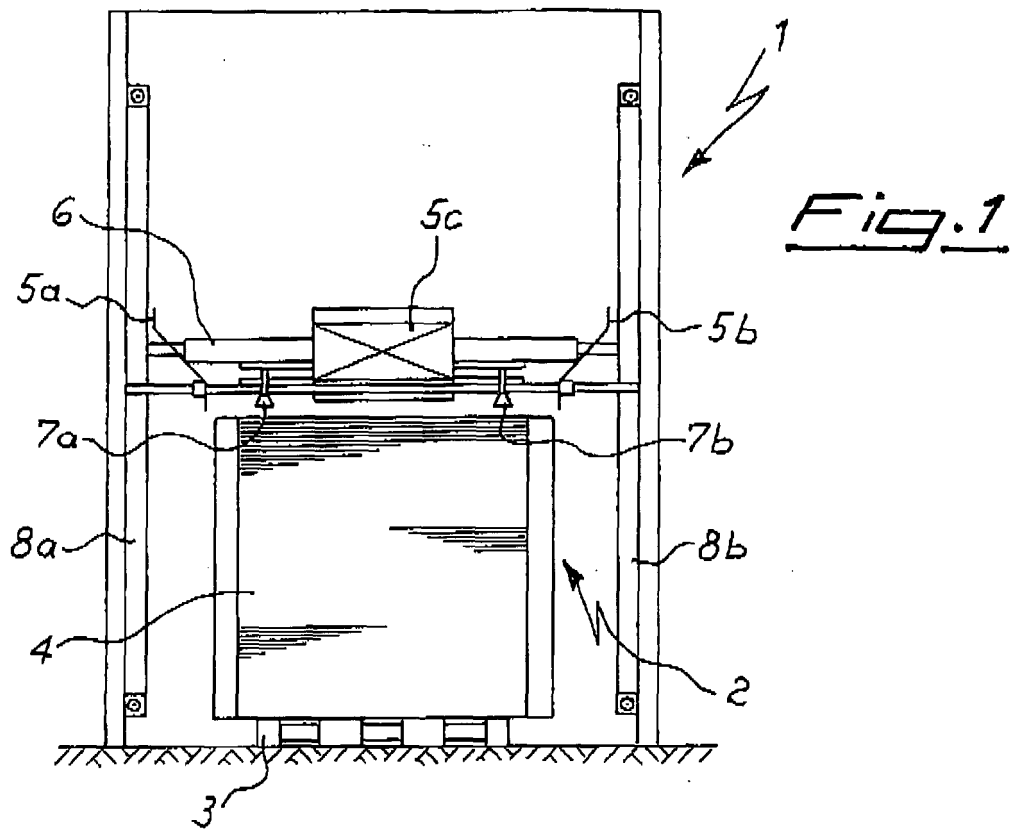
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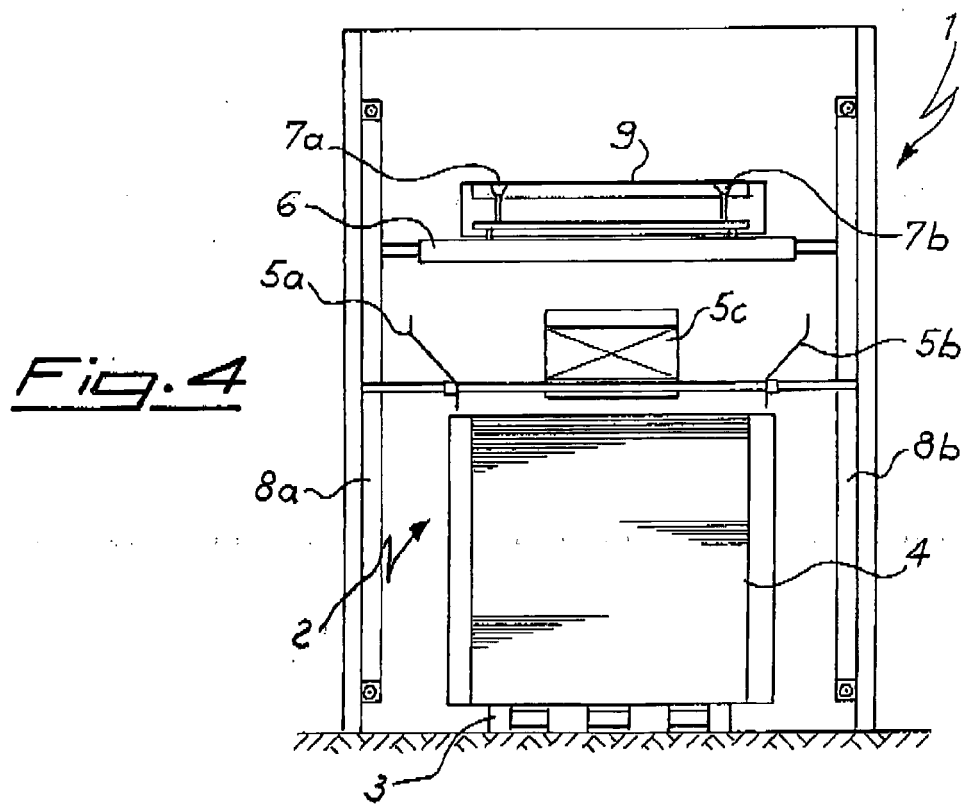
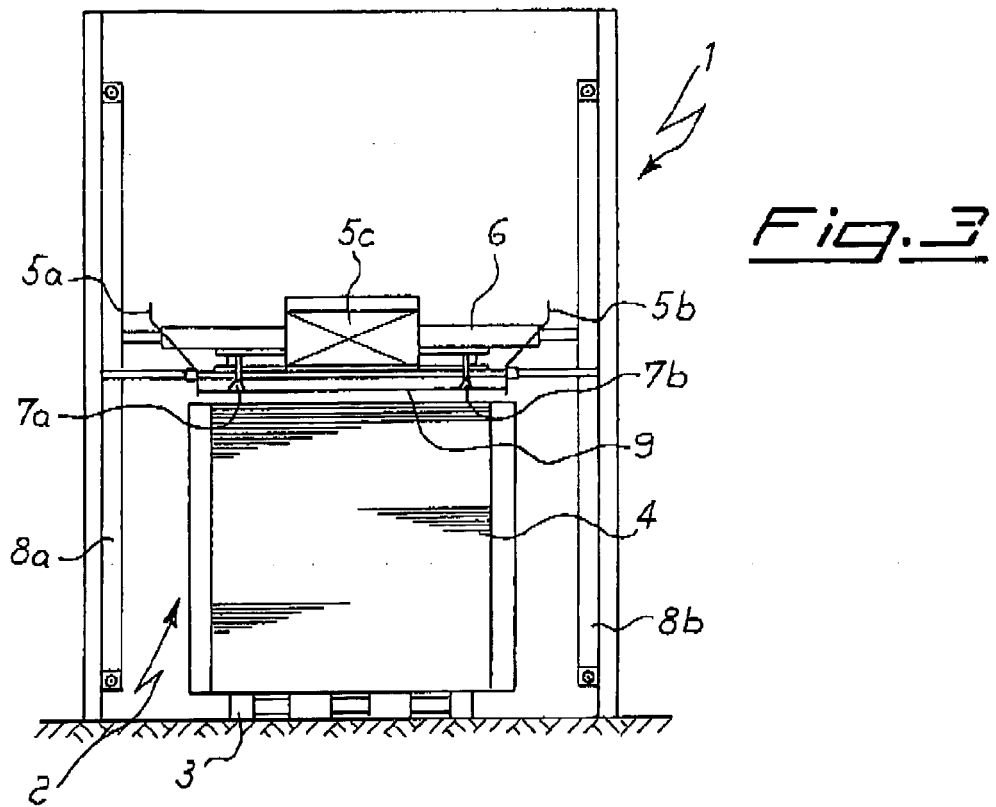


Fig. 5

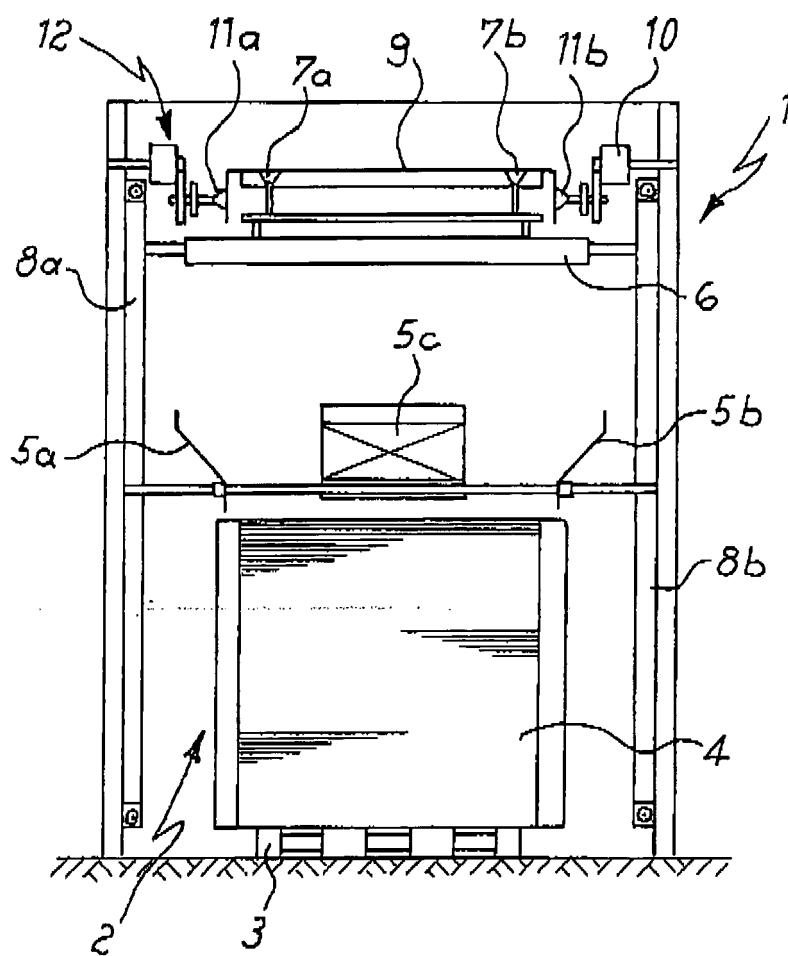


Fig. 6

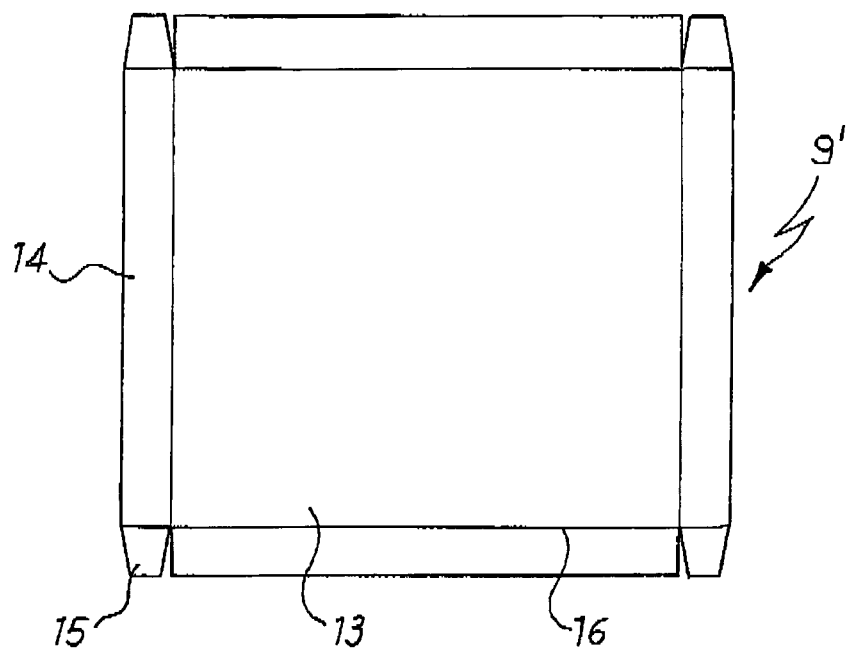
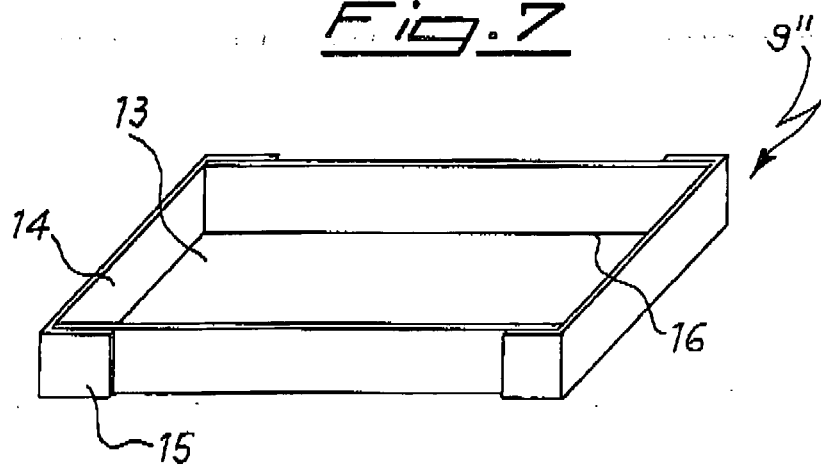


Fig. 7



REFERENCES CITED IN THE DESCRIPTION

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