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(72) Inventor: **Isao, Hirata**
Osaka (JP)

(74) Representative: **White, Duncan Rohan**
Marks & Clerk LLP
90 Long Acre
London
WC2E 9RA (GB)

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(71) Applicant: **ASAHI MACHINERY LIMITED**
Takaishi-shi
Osaka (JP)

(54) **Flat board stamping apparatus**

(57) A work adjustable positioning mechanism (18) is disposed between a loading stage (15) arranged near the front end portion of the work feeder (3) and an entrance portion of the transferring unit (10), which comprises a pair of bracket bearings (20, 20) disposed at the opposite sides of the loading stage (15); a slide bar (21) supported on each end by the respective bracket bearings whereby the slide bar extends lengthwise perpendicular to the travel of the sheet material (2) loaded into the loading stage (15) towards the transferring unit (10); and a pair of sliding contactors (26, 26) supported on the slide bar (21), each of which is configured to be slidable in horizontal directions and extends crossways perpen-

dicular to the length of the slide bar, wherein as a sheet material (2) from the work feeder (3) advanced into a space between the sliding contactors rested apart on the slide bar (21) in a determined position, both sliding contactors being slid inward simultaneously to approach to each other and brought to bear on each lateral side of the loaded sheet material (2), at which position those sliding contactors are stopped sliding at the same time, the position of the loaded sheet material (2) relative to a determined loading section of the transferring unit (10) is locked by releasing activation of those sliding contactors (26) so that the located sheet material (2) is loaded into the transferring unit (10) as it is.

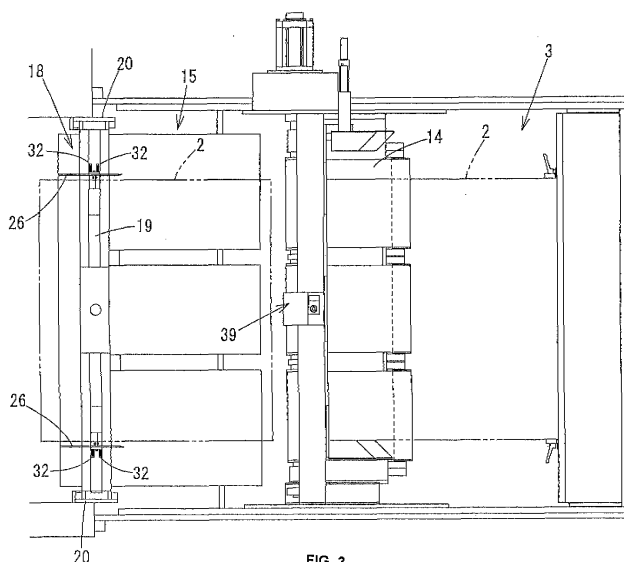


FIG. 3

Description

Technical Field

[0001] The present invention relates to a flat board stamping apparatus for pressing and stamping out a sheet material such as a corrugated cardboard sheet, a thick paper, a film, and the like.

Background Art

[0002] Conventionally, a flat board stamping apparatus is known for stamping out of sheet materials such as corrugated cardboard sheets with a specified stamping die, and then knocking off a product part of the stamped sheet materials. Typically, the flat board stamping apparatus, as described in EP 1733855A1, comprises a work feeder for loading to-be-stamped sheet materials, that is, workpieces intermittently one by one from a stacking sheet material into a transferring unit, which is equipped with in sequence a pressing portion for pressing a pre-determined pattern on a sheet material by using a proper stamping die, a stripping portion for stripping a non-product part from the pressed to-be-stamped material while leaving a product part and a gripper margin, a knocking portion for separating the product part from the gripper margin, and a delivery portion for accommodating the product part separated through the knocking-off portion, wherein each sheet material loaded from the work feeder into the transferring unit travels throughout said four portions in sequence.

[0003] In the above-described conventional flat board stamping apparatus, once one of stacking sheet material fed from the feeder being loaded into the transferring unit, a setting position of the fed sheet material on the respective operating portions is held throughout from the first pressing portion to the last delivery portion. Therefore, it is important to accurately positioning each sheet material relative to a determined position in an entrance portion of the transferring unit before having it loaded into there.

[0004] On the other hand, it needs for improvement of productivity to increase a transferring speed of a transferring device, but in such a case of a conventional type of flat board stamping apparatus that the sheet material is drawn out one at a time from a stacking sheet material stocked in the work feeder and then loaded respectively into the entrance portion of the transferring unit, there is a need for more increasing of feeding a sheet material drawn out from the work feeder into the transferring unit at a significant high speed. Therefore, a positional setting miss of the sheet material relative to a determined loading section is likely to occur at the time of loading the sheet material drawn out from the feeder into the entrance portion of the transferring unit.

[0005] Since a sheet material has a design such as characters and a drawing pattern applied thereto in advance, at a time of stamping out the printed sheet material even a slight out of alignment of the printed design to a

position of the stamping die causes a defective product. Thus, there has been a problem in that a fraction defective of product is increased, and that the productivity is deteriorated. Therefore, it has not been possible to sufficiently improve a processing speed (transferring speed) of the flat board stamping apparatus.

Disclosure of the Invention

[0006] The present invention has been proposed in view of the above-described problems, and an object of the present invention is to improve on a type of flat board stamping apparatus comprising a work feeder 3 delivering a plurality of constant configuration sheet materials, for example, fixed rectangular sheet materials 2 one at a time; a transferring unit for carrying in sequence each one of the sheet material loaded from the work feeder with keeping hold a part of the sheet material on an endless conveyor; a pressing portion for stamping each sheet material loaded thereon with a fixed pattern stamping die; a stripping portion for stripping off a non-product part from the sheet material stamped out at the pressing portion while leaving a product part and a gripper margin therein; a knock off portion for knocking off the product part from the gripper margin; and a delivery portion for accommodating the product part cut out at the knock off portion in which loading a sheet material from the work feeder into the transferring unit is performed with constantly positioning a sheet material with respect to a fixed position to be stamped out in the pressing portion even in the case where a transferring speed of the transferring unit is increased, and also capable of improving productivity by preventing occurrence of a defective material as much as possible.

[0007] A flat board stamping apparatus according to the present invention is principally **characterized in that** a work adjustable positioning mechanism is disposed between a loading stage arranged near the front end portion of the work feeder and an entrance portion of the transferring unit, said work adjustable positioning mechanism comprising a pair of bracket bearings disposed at the opposite sides of the loading stage; a slide bar supported on each end by the respective bracket bearings whereby the slide bar extends lengthwise perpendicular to the travel of the sheet material loaded into the loading stage towards the transferring unit; and a pair of sliding contactors supported on the slide bar, each of which is configured to be slidable in horizontal directions and extends crossways perpendicular to the length of the slide bar, wherein as a sheet material from the work feeder advanced into a space between the sliding contactors rested apart on the slide bar in a determined position, both sliding contactors being slid inward simultaneously to approach to each other and brought to bear on each lateral side of the loaded sheet material, at which position those sliding contactors are stopped sliding at the same time, the position of the loaded sheet material relative to a determined loading section of the transferring unit is locked

by releasing activation of those sliding contactors so that the located sheet material is loaded into the transferring unit as it is.

[0008] In addition, said flat board stamping apparatus is equipped with a cam feeding mechanism comprising a geared driving mechanism arranged to rotate the slide bar as the drive of the transferring unit is powered; a pair of edge cams fixed on the slide bar at a fixed position respectively; a pair of slide blocks each mounted on the slide bar to slide freely in horizontal directions; a pair of horizontal slide tables each mounted on the slide blocks and being slidable inward in one direction only along the slide bar; a pair of contactor segments mounted fixedly on the horizontal slide tables, each of which extends horizontally perpendicular to the length of the slide bar; and a pair of cam rolls each mounted fixedly on the horizontal slide tables and borne on the cam faces of the edge cams, wherein as a sheet material being fed into the loading stage from the work feeder, both horizontal slide tables are moved inward to be approached to each other according to the rotation of the edge cam on the slide bar rotated through the geared driving mechanism.

[0009] Further, said flat board stamping apparatus is provided with a pair of slide block feeding mechanism comprising a pair of rack bars mounted on the bracket bearings parallel to the slide bar in one straight line, a pair of pinions each engaged with the respective rack bars; a pair of motors arranged to be driven as the drive of the transferring unit is powered; and a pair of gear trains connected to the respective output shafts, wherein as a sheet material being fed into the loading stage from the work feeder, both slide block are moved horizontally on the slide bar by driving the motors through the gear train, the rack bar and the pinion each.

[0010] Further more, in said flat board stamping apparatus, the transferring unit includes an endless roller conveyor circulating above the pressing portion, the stripping portion, the knock off portion and the delivery portion in sequence, on which a plurality of holding members for locking a part of each sheet material loaded intermittently through the loading stage, are located at a fixed intervals.

[0011] According to the flat board stamping apparatus of the present invention, before securing each sheet material (workpiece) loaded onto a conveyor of the transferring unit by the respective holding members mounted on the conveyor, each loaded sheet material having been constantly positioned relative to the determined part of the conveyor with the work adjustable positioning mechanism and then the adjusted positioning of the sheet materials are sustained stably by securing of the holding members for a relevant stamping cycle. Thus, even if the traveling speed of the conveyor of the transferring unit is increased, an accurate positioning of the sheet material is maintained in sequence of the operations in the flat stamping apparatus.

[0012] Accordingly, it is possible to continuously load a sheet material, having a design such as characters and drawings applied thereto in advance, from the work feed-

er through the loading stage to the determined loading part of the transferring unit in position, and also possible to accurately stamp out each sheet material having the determined design of characters and drawings as above. Accordingly, even if the traveling speed of the transferring unit is increased, it is possible to prevent an occurrence of defective product as much as possible. Thus, a flat board stamping apparatus capable of improving productivity can be provided.

Brief Description of the Drawings

[0013]

FIG. 1 is a front view illustrating a schematic structure of the flat board stamping apparatus according to the present invention;

FIG. 2 is a front view of the flat board stamping apparatus according to the present invention;

FIG. 3 is a plan view of the work adjustable positioning mechanism in the flat board stamping apparatus according to the present invention;

FIG. 4 is a side view illustrating the work adjustable positioning mechanism in the flat board stamping apparatus according to the present invention;

FIG. 5 is a front view of the work adjustable positioning mechanism in the flat board stamping apparatus according to the present invention; and

FIG. 6 is an enlarged partial front view of the work adjustable positioning mechanism in the flat board stamping apparatus according to the present invention.

Best Mode for Carrying Out the Invention

[0014] Hereunder, a preferred embodiment of a flat board stamping apparatus according to the present invention will be illustrated with reference to accompanying drawings.

[0015] As shown in FIG. 1 and FIG. 2, a flat board stamping apparatus 1 according to an embodiment of the present invention includes: a work feeder (a sheet material to be stamped, that is, workpiece feeding portion) 3 having a stock of stacking constant configuration sheet materials 2 such as corrugated cardboard sheets each having a fixed shapes, for example, rectangular and dimensions a printed surface layer of characters, drawings or the like applied thereon; a pressing portion 4 for pressing and stamping out of a sheet material 2 with a predetermined pattern stamping die; a stripping portion 5 for stripping a non-product part from the stamped sheet material 2 while leaving a product part and a gripper margin; a knocking-off portion 8 for separating the product part from the gripper margin; a delivery portion 9 for accommodating the product part separated in the knocking-off portion 8; and a transferring unit 10 for conveying each sheet material 2 loaded one by one from the stacking sheet material stocked in the work feeder 3 and passing

sequentially over the pressing portion 4, the stripping portion 5, the knocking-off portion and the delivery portion 9 in this order.

[0016] The transferring unit 10 is comprised of an endless roller chain conveyer 12 having a plurality of holding members 11, 11, ---, 11 each of which being configured to hold detachably a part of the loaded sheet material 2, for example, a gripper margin stamped out after having performed stamping in the pressing portion 4 and being disposed thereon at fixed intervals. The endless roller chains (conveyer) 12 are engaged with a pair of feed wheels 13 driven intermittently as the pressing portion 4 is operated so that each sheet material 2 secured with the holding members 11 mounted on the roller conveyer 12 travels intermittently over the portions 4, 5, 8 and 9 in sequence.

[0017] A loading stage 15 is constructed of three setting plates arranged in, for example, a rectangular plane near the front end portion of the work feeder 3 and delivery conveyer devices 14 each corresponding to each setting plate. A front end of the loading stage 15 is opposed to the delivery end of the work feeder 3, its rear end being arranged on a level with an entrance section or a loading area of the endless roller conveyer 12 of the transferring unit 10. Whenever a sheet material 2 is intermittently drawn out at uniform intervals from a stacking sheet materials stocked in the work feeder 3 and fed into the loading stage 15 through those delivery conveyer devices 14, each drawn out sheet material 2 is adjusted by a work adjustable positioning mechanism 18 detailed hereunder in a fixed position relative to the determined loading section or area on the loading stage 15, accordingly, on the endless roller conveyer 12. Thereafter, each sheet material 2 adjusted in the loading position is loaded intermittently at uniform intervals into the respective determined sections of the endless roller conveyer 12, at each section of which the above-mentioned holding members 11 are fixed, so that these sheet materials 2 loaded and locked by the holding members 11 on the roller conveyer 12 are stopped above the respective operating portions 4, 5, 8 and 9 whenever the drive of the roller conveyer 12 rests, accordingly the load of sheet materials 2 rests.

[0018] The pressing portion 4 for pressing a predetermined pattern on the loaded sheet material 2 is arranged near the discharging side of the loading stage. The pressing portion 4 includes a fixed plate 16 mounted upper portion and a pressing die 17 located under the loaded sheet material 2 in which the pressing die 17 is moved vertically toward the fixed plate 16 whereby the sheet material 2 interposed between the fixed plate 16 and the presser plate 17 is stamped out a pattern according to that of the die as well as divided into the product part, the gripper margin, and the non-product part.

[0019] On the downstream side of the pressing portion 4, the stripping-off portion 5 is arranged, in which the stripping-off portion 5 strips off only the non-product part from the sheet material 2 while leaving the product part

and the gripper margin.

[0020] In a space between the loading stage 15 near the front end portion of the work feeder 3 and the entrance portion of the transferring unit 10, the above-mentioned work adjustable positioning mechanism 18 is disposed to adjust a positioning of the sheet material 2 relative to each determined loading section on the endless roller conveyer 12 of the transferring unit 10.

[0021] As shown in FIG. 3 to FIG. 6, the work adjustable positioning mechanism 18 includes a pair of bracket bearings 20, 20 mounted on a guide beam 19 and disposed at the opposite lateral ends of the loading stage 15. A slide bar 21 is supported on each end by the respective bracket bearings 20 wherein the slide bar 21 extends lengthwise perpendicular to the travel of the sheet material 2 loaded into the loading stage 15 through the delivery conveyer devices 14 towards the entrance of the transferring unit 10. Further, the work adjustable positioning mechanism 18 includes a pair of sliding contactors 26, each of which is composed of a contactor segment made of, for example, metal plate materials. The sliding contactor 26 can be incorporated in a slide block 25 as described hereunder.

[0022] As shown in Figs. 3 and 4, a cam feeding mechanism 28 comprises generally a geared driving mechanism 23, a pair of edge cams 30, a pair of slide blocks 25, a pair of horizontal tables 27, a pair of contactor segments 26 and a pair of cam rolls 31.

[0023] The geared driving mechanism 23 is arranged to rotate the slide bar 21 through a sprocket 23 mounted at the middle of the slide bar 21 and pulleys (not shown) engaged with a driving unit (not shown) of the transferring unit 10 whereby the geared driving mechanism 23 is activated as the driving unit of the transferring unit 10 is powered, that is, the geared driving mechanism 23 is synchronized with the operation of the transferring unit 10.

[0024] The above-mentioned slide blocks 25, 25 are mounted on the slide bar 21, each of which is arranged to slide freely in horizontal directions at ranges close to each end of the guide beam 19 as seen from Fig 4. Both horizontal slide tables 27, 27 are mounted each on the slide blocks 25, 25 and being slidable on one inward direction only with respect to the length of the slide bar 25. Said contactor segments 26, 26 are mounted fixedly on the horizontal slide table 27, 27 respectively. Further, vertical cam rolls 31, 31 are bolted to the horizontal slide table 27, 27 respectively, each of which is borne on the cam face 30a of the edge cam 30.

[0025] The geared driving mechanism 23, the pairs of the edge cam 30, the slide block 25, the horizontal slide table 27, the contactor segment 26 and the cam roll 31 are made up a pair of slide block feeding mechanisms 34, 34. As the slid bar 21 is rotated by the activation of the geared driving mechanism 23, the slide blocks 25, accordingly the horizontal slide tables 27 are moved laterally inward according to the rotation of the edge cam 30 on the slide bar 21 so as to be approached to each

other along the length of the slide bar 21. Besides, as shown in Fig. 3, the respective edge cams 30 are pressed against the corresponding cam rolls 31 by compression springs 34, 34 embedded in opposite ends of the slide bar 21 each thereby each cam face 30a of the edge cam 30 constantly being brought to bear on the cam rolls 31.

[0026] Further, a pair of rack bars 35, 35 are mounted each on the bracket bearings 20, 20 parallel to the slide bar 21 in one straight line, each of which is connected to the slide block 25 through a pinion 36 engaged therewith. Both rack bars 35, 35 are connected to motors 37, 37 through gear trains 38, 38 respectively. Each motors 37 is arranged to be driven as the drive of the transferring unit 10 is powered so that the motors 37 are synchronized to the operation of the endless chain conveyer 12 of the transferring unit 10. In this way, a pair of slide block feeding mechanism 34 is comprised of those pairs of rack bar 35, pinion 36, motor 37 and gear train 38. In the slide block feeding mechanism 34, before a sheet material 2 has been fed into the loading stage 15 from the work feeder 3, both slide blocks 25 are moved laterally close to the opposite ends of the slide bar 21 by driving the motors 37 through the gear train 28, the rack bar 35 and the pinion 36. Resultantly, both slide blocks 25, accordingly the contactor segments 26 on the horizontal slide tables 27 are roughly moved outside a little apart from each lateral side of the loaded sheet material 2 so that the sheet material 2 is enabled to pass through a space between both contactor segments 26, 26.

[0027] Reference numeral 39 in the drawings represents a back pusher for pushing the rear end of the sheet material 2 down out from the delivery conveyer devices 14 in the loading stage 15.

[0028] Next, an operation of the flat board stamping apparatus 1 according to the present invention is explained in reference to the accompanying drawings.

[0029] At first, a plurality of sheet materials 2, such as printed corrugated cardboard sheets, each having a design including characters, drawings, and the like applied to a surface thereof, are charged in a staking of sheet materials in the work feeder 3.

[0030] At starting of the activation of the flat board stamping apparatus 1, a bottommost one of the stacking of sheet materials in the work feeder 3 is sucked and fed successively by the feeder conveyer 14 in the loading stage 15.

[0031] As shown in FIG. 6, the sheet material 2 is fed into the loading stage 15 through the delivery conveyer 14 while the rear end of the down out sheet material 2 is pushed by the back pusher 39 toward the front end of the loading stage 15 and at the time, the slide block feeding mechanisms 34 are activated by driving motors 37 by the gear trains 38. Resultantly, both slide blocks 25 are moved through the rack bars 35 and the pinions 36 laterally on the slide bar 21 toward close to the opposite ends of the slide bar 21 respectively.

[0032] Simultaneously, the slide bar 21 is rotated by the geared driving mechanism 23 synchronized with the

activation of the stamping apparatus 1 at a speed. As a sheet material 2 loaded into the loading stage 15 from the work feeder 3 advanced into a space between the sliding contactors or the contactor segments 26, 26 rested apart on the slide bar 21 in a determined position, both sliding contactors 26, 26 being slid inward simultaneously to approach to each other and brought to bear on each lateral side of the loaded sheet material 2, at which position those sliding contactors are stopped sliding at the same time, the position of the loaded sheet material 2 with respect to a predetermined section of the loading stage 15 or a predetermined loading section of the transferring unit 10 is locked by releasing activation of those sliding contactors 26, that is, by shifting high of the edge cam 30 and then the positioned sheet material 2 is loaded into the transferring unit 10 as it is.

[0033] As the positioned sheet material 2, that is, the position of the sheet material adjusted through the adjustable positioning mechanism 18, is loaded into a fixed section of the endless roller conveyer 12, the sheet material 2 is locked by a holding member 11 disposed in the section so that the position of the sheet material 2 relative to a fixed section or the reference section of the pressing portion 4 is maintained in the same for all the operations performed at the pressing portion 4 through the last delivery portion 9 in a stamping cycle.

[0034] In this manner, since the sheet material 2 is retained on the transferring unit 10 immediately after the correction of the position thereof, Accordingly, it is possible to accurately perform the succeeding processes, i.e., pressing, punching, and separation, and thus it is possible to accurately perform punching process adapted to the design such as characters and drawings drawn on the surface of the sheet material 2.

[0035] Further, it is possible to prevent, as much as possible, occurrence of the defective material, which is caused by the pressing process performed on the sheet material in misalignment of the sheet material to the stamping die.

[0036] While a sheet material is automatically adjusted in the specified position in the loading stage 15, the delivery conveyer device 14 is continuously driven. Accordingly, in order to level up the productivity of the stamping apparatus, even when the feed rate of sheet material is increased, each sheet material 2 is successfully adjusted by virtue of the work adjustable positioning mechanism 18 until having been loaded into the endless roller conveyer 12 of the transferring unit 10. Therefore, it is possible to increase the productivity effectively.

[0037] Further, as described above, since the delivery conveyer devices 14 are in usual driven continuously, the succeeding one of the sheet materials 2 can be fed in a manner to be partially overlapped on the preceding sheet material 2. Accordingly, there is no need to drive the delivery conveyer devices 14 intermittently, and instead, it is possible to set a driving speed, that is, a feeding speed, of the feeder conveyer 14 significantly lower than that in a case where the sheet materials 2 are fed

one by one intermittently. In other words, the driving speed of the delivery conveyer devices 14 are adaptable to even a high transferring speed of the transferring unit 10, which consequently enables improvement in productivity.

[0038] Without limiting to a configuration, described in the above embodiment, in which slide block feeding mechanism 34 is connected to the driving portion of the transferring unit 10 and is interlocked with the intermittent driving of the transferring unit 10, but the slide bar 21 can be rotated by using a motor that is timing-driven directly by a control device. Alternatively, such an edge cam plate 30 can be rotated.

[0039] Further, instead of the cam feeding mechanism 28, an air cylinder or a solenoid is applicable as an interlocking device for the work adjustable positioning mechanism 18.

Claims

1. A flat board stamping apparatus comprising a work feeder (3) delivering a plurality of constant configuration sheet material (2) one by one; a transferring unit (10) for carrying in sequence each one of the sheet material (2) loaded from the work feeder with keeping hold a part of the sheet material on an endless conveyer; a pressing portion (4) for stamping each sheet material loaded thereon with a fixed pattern stamping die; a stripping portion (5) for stripping off a non-product part from the sheet material (2) stamped out at the pressing portion (4) while leaving a product part and a gripper margin therein; a knock off portion (8) for knocking off the product part from the gripper margin; and a delivery portion (9) for accommodating the product part cut out at the knock off portion,
characterized in that
a work adjustable positioning mechanism (18) is disposed between a loading stage (15) arranged near the front end portion of the work feeder (3) and an entrance portion of the transferring unit (10), said work adjustable positioning mechanism comprising a pair of bracket bearings (20, 20) disposed at the opposite sides of the loading stage (15); a slide bar (21) supported on each end by the respective bracket bearings (20, 20) whereby the slide bar extends lengthwise perpendicular to the travel of the sheet material (2) loaded into the loading stage (15) towards the transferring unit (10); and a pair of sliding contactors (26, 26) supported on the slide bar (21), each of which is configured to be slidable in horizontal directions and extends crossways perpendicular to the length of the slide bar (21), wherein as a sheet material (2) from the work feeder (3) advanced into a space between the sliding contactors (26, 26) rested apart on the slide bar (21) in a determined position, both sliding contactors (26, 26) being slid inward

simultaneously to approach to each other and brought to bear on each lateral side of the loaded sheet material (2), at which position those sliding contactors are stopped sliding at the same time, the position of the loaded sheet material (2) relative to a determined loading section of the transferring unit (10) is locked by releasing activation of those sliding contactors (26) so that the located sheet material (2) is loaded into the transferring unit (10) as it is.

2. The flat board stamping apparatus according to Claim 1, wherein further it is equipped with a cam feeding mechanism (28) comprising a geared driving mechanism (23) arranged to rotate the slide bar (21) as the drive of the transferring unit (10) is powered; a pair of edge cams (30, 30) fixed on the slide bar (21) at a fixed position respectively; a pair of slide blocks (25, 25) each mounted on the slide bar (21) to slide freely in horizontal directions; a pair of horizontal slide tables (27, 27) each mounted on the slide blocks (25, 25) and being slidable inward in one direction only along the slide bar (21); a pair of contactor segments (26, 26) mounted fixedly on the horizontal slide tables, each of which extends horizontally perpendicular to the length of the slide bar (21); and a pair of cam rolls (31, 31) each mounted fixedly on the horizontal slide tables and borne on the cam faces (30a) of the edge cams (30), wherein as a sheet material (2) being fed into the loading stage (15) from the work feeder (3), both horizontal slide tables (27, 27) are moved inward to be approached to each other according to the rotation of the edge cam (30) on the slide bar (21) rotated through the geared driving mechanism (23).
3. The flat board stamping apparatus according to Claim 2, wherein further there is provided with a pair of slide block feeding mechanism (34, 34) comprising a pair of rack bars (35, 35) mounted on the bracket bearings (20, 20) parallel to the slide bar (21) in one straight line, a pair of pinions (36, 36) each engaged with the respective rack bars (35); a pair of motors (37, 37) arranged to be driven as the drive of the transferring unit (10) is powered; and a pair of gear trains (38, 38) connected to the respective output shafts of the motors (37, 37), wherein as a sheet material (2) being fed into the loading stage (15) from the work feeder (3), both slide block (25) are moved horizontally on the slide bar (21) by driving the motors (37) through the gear train (38), the rack bar (35) and the pinion (36) each.
4. The flat board stamping apparatus according to any one of Claims 1 to 3, wherein the transferring unit (10) includes an endless roller conveyer (12) circulating above the pressing portion (4), the stripping portion (5), the knock off portion (8) and the delivery portion (9) in sequence, on which a plurality of hold-

ing members (11) for locking a part of each sheet material (2) loaded intermittently through the loading stage (15), are located at a fixed intervals.

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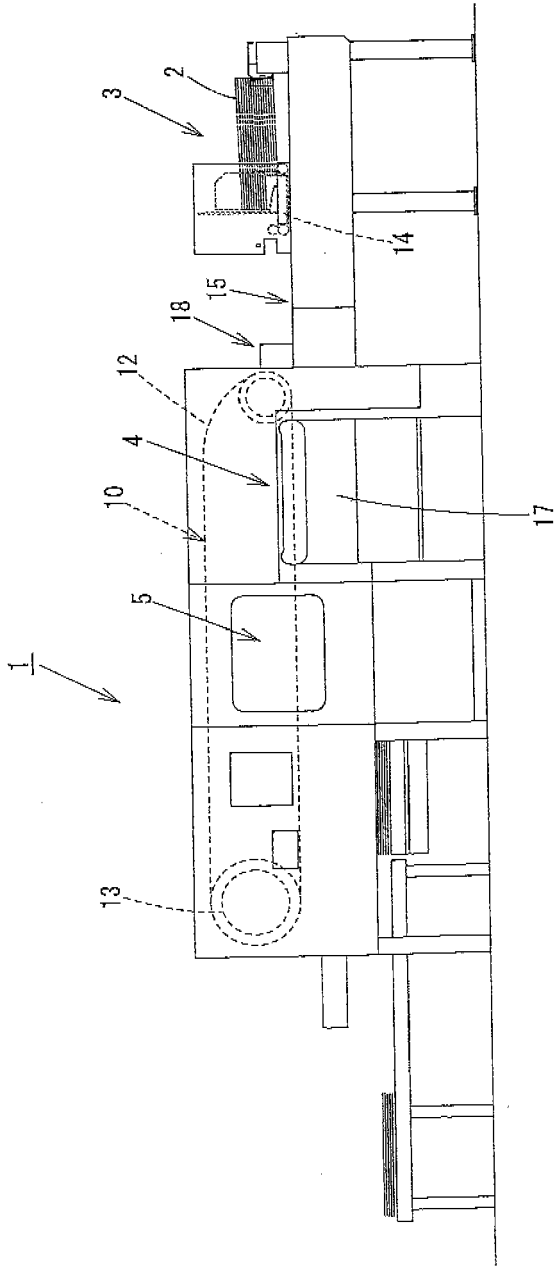


FIG. 1

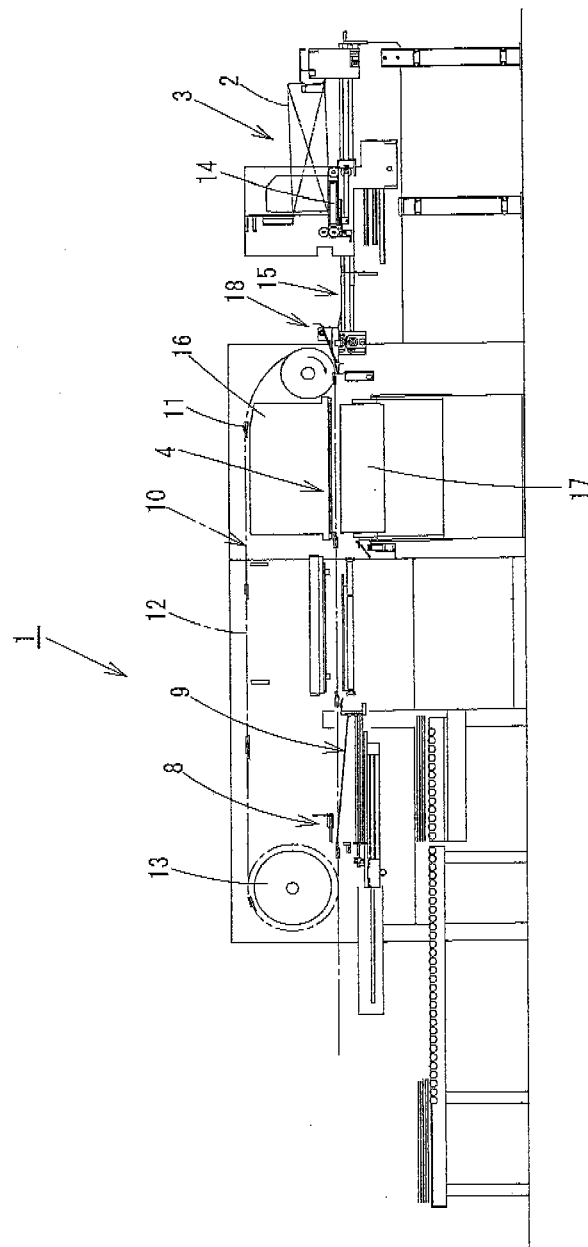
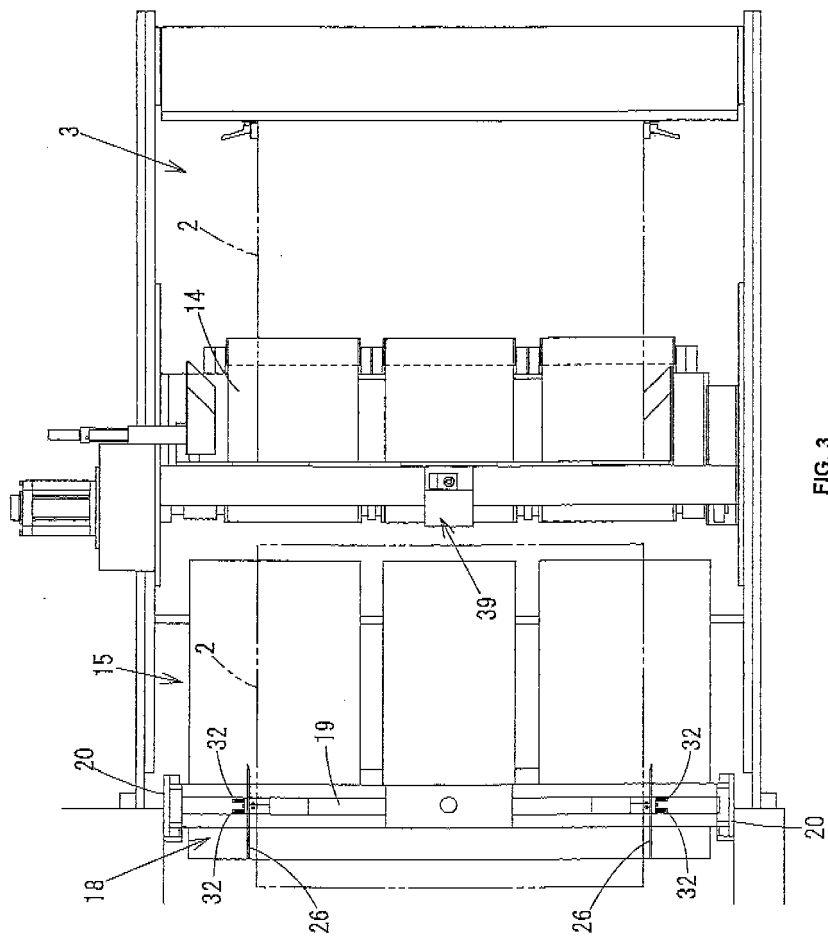


FIG. 2



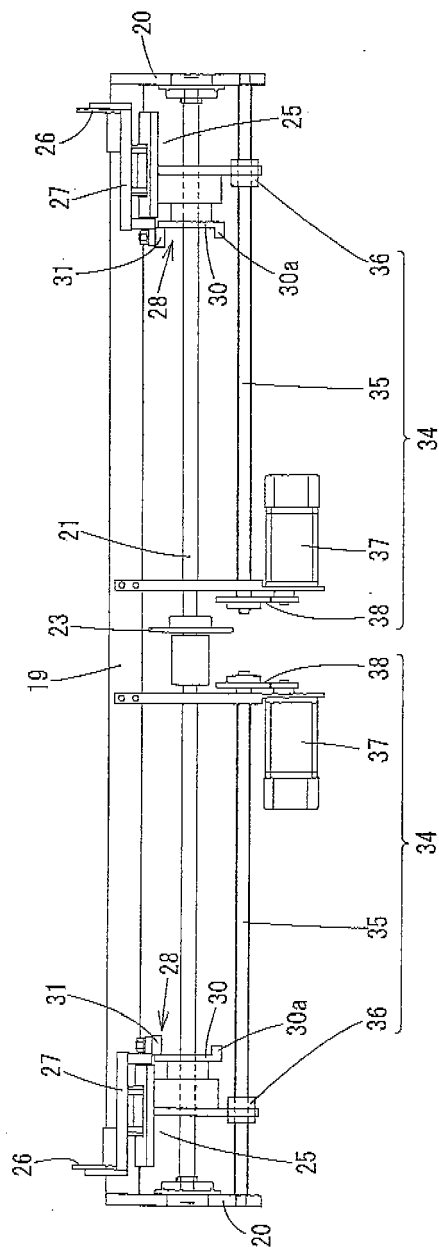


FIG. 4

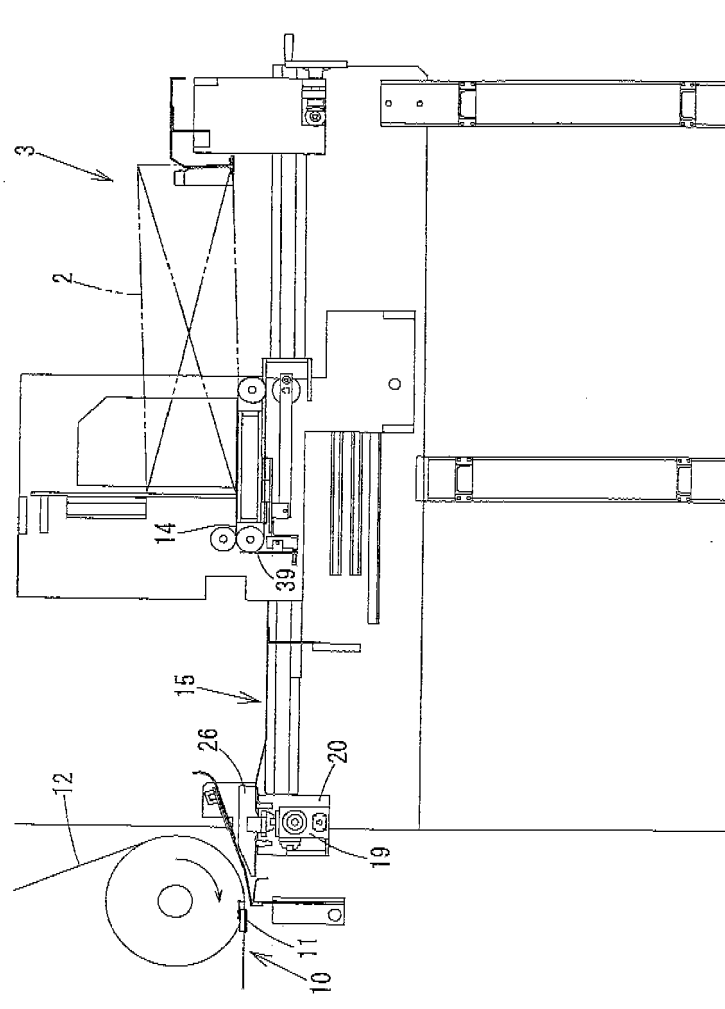
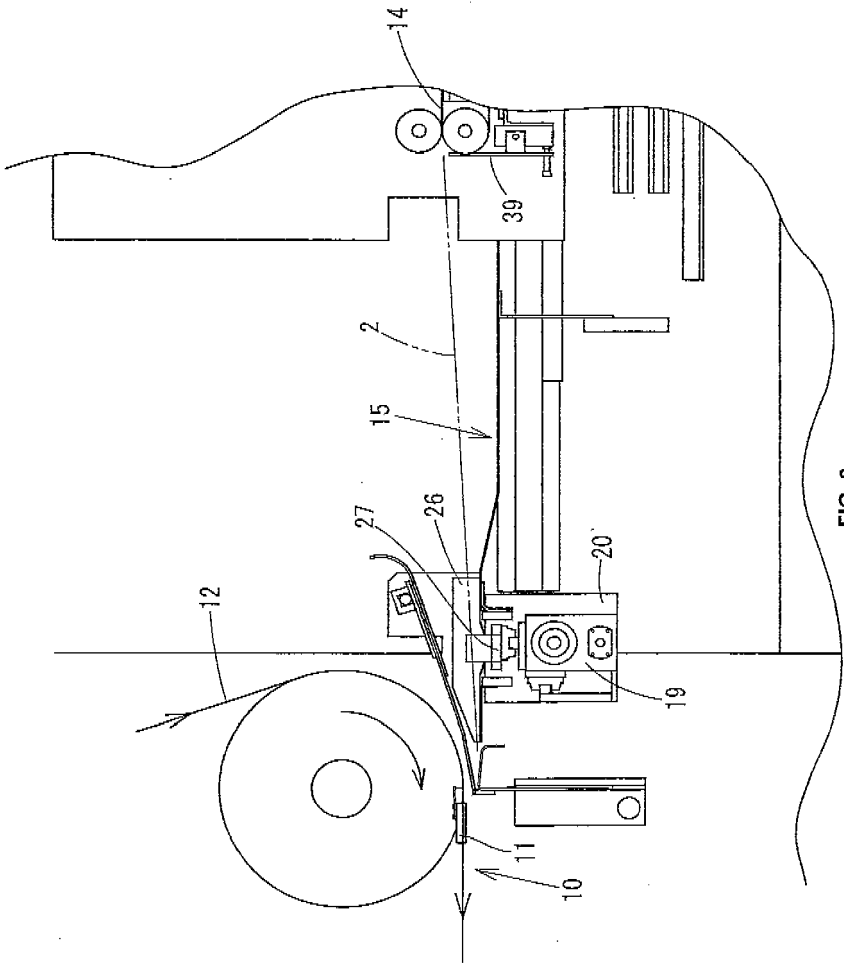


FIG. 5



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1733855 A1 [0002]