May 28, 1946. A. PELIKAN 2,401,270

MECHANISM FOR PUNCHING TO INTERLOCK SHEETS OF MATERIAL

Filed May 22, 1944 2 Sheets-Sheet 1

FIG. 1

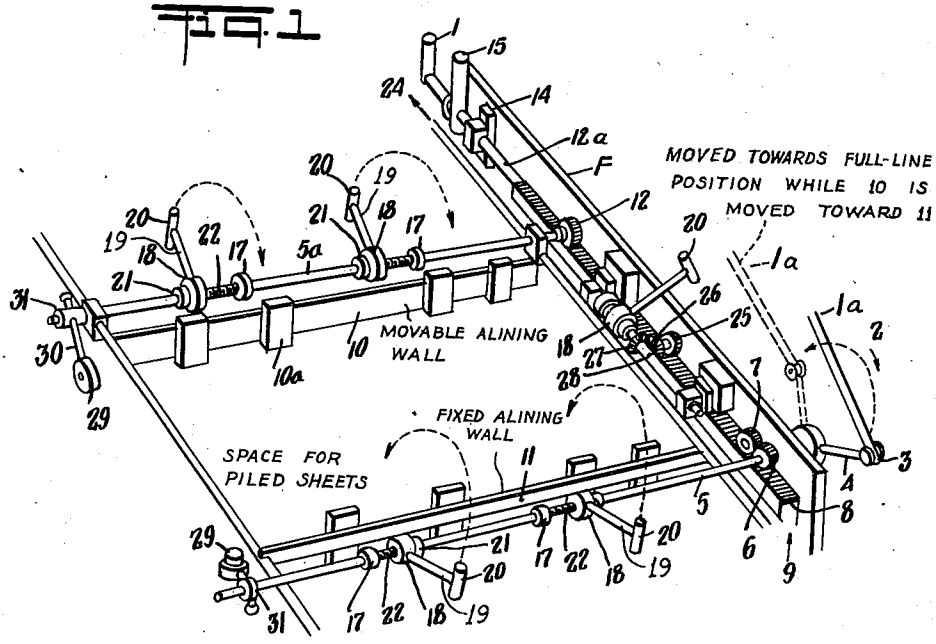


FIG. 2

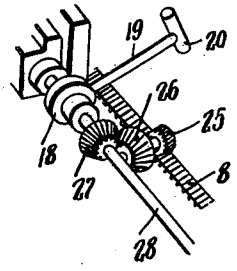


FIG. 4

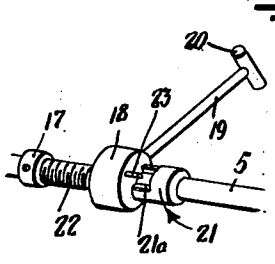
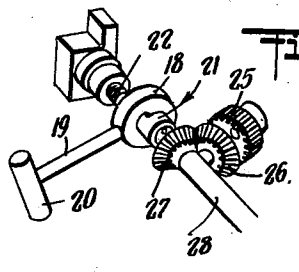


FIG. 3



INVENTOR.
Alexander Pelikan
BY
Mock & Blum
ATTORNEYS

May 28, 1946. A. PELIKAN 2,401,270

MECHANISM FOR PUNCHING TO INTERLOCK SHEETS OF MATERIAL

Filed May 22, 1944 2 Sheets-Sheet 2

FIG. 5

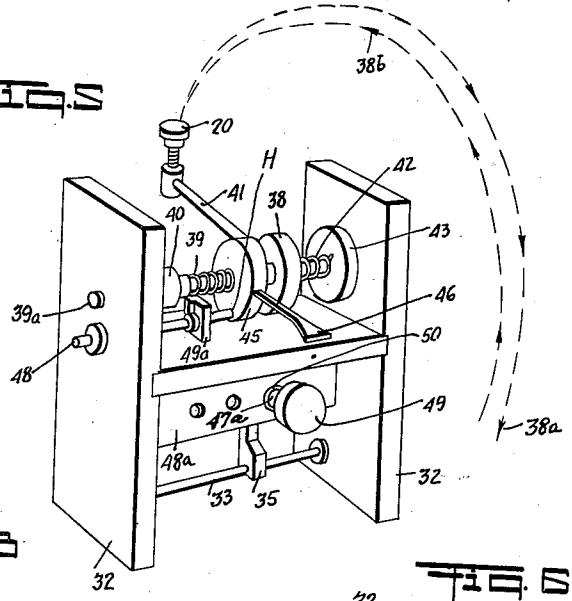


FIG. 8

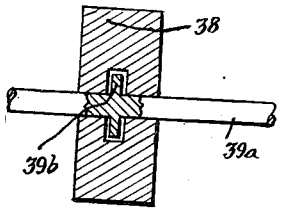


FIG. 6

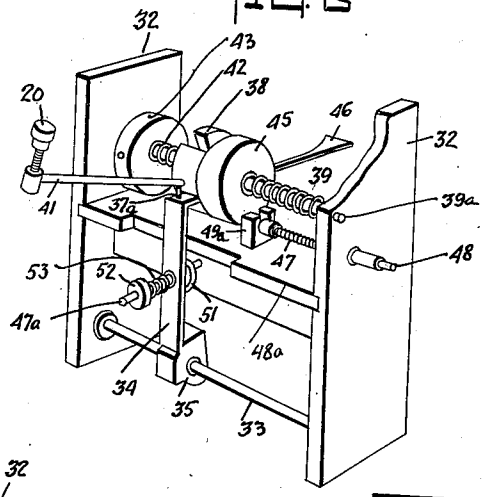


FIG. 7

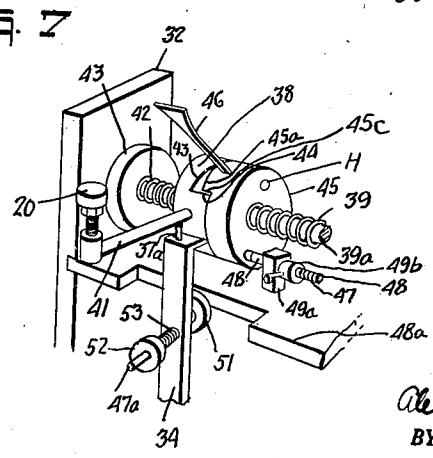
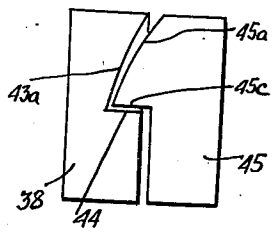


FIG. 9



INVENTOR.

Alexander Pelikan

BY

Mock & Blum

ATTORNEYS

Patented May 28, 1946 2,401,270

UNITED STATES PATENT OFFICE

2,401,270

MECHANISM FOR PUNCHING TO INTERLOCK SHEETS OF MATERIAL

Alexander Pelikan, New York, N. Y., assignor to Federal Carton Corporation, New York, N. Y., a corporation of New York

Application May 22, 1944, Serial No. 536,777

8 Claims. (Cl. 164—86)

My invention relates to new and improved mechanism for punching, to interlock sheets of material, such as carton-blanks.

It is well-known to cut and score a planar sheet of cardboard, in order to make a carton blank from a part of said sheet, without separating said carton blank from the remainder of said sheet. The cut and scored sheet of cardboard has waste areas or trim-areas, in addition to the areas which constitute the parts of the blank. It is therefore necessary to separate the completed blank from the sheet of cardboard.

The individual manual separation of each blank from the respective sheet of cardboard is slow and expensive.

It has therefore been proposed to pile the sheets of cardboard, with their respective edges vertically alined, thus providing a pile of 1500 or more sheets. This pile is then struck with a reciprocating pneumatic hammer or other tool, which operates in downward vertical strokes, in order to separate the vertically assembled blanks from said pile. This tool is held in the hand of the operator.

In order to use this labor-saving method, it is necessary to interlock the vertically assembled pile of sheets, either at their vertically alined waste areas, or in the vertically alined areas of the blanks, in order to prevent said sheets from shifting laterally relative to each other while the pneumatic hammer was directed by hand, in order to separate the vertically assembled blanks from said vertically piled sheets. Such pneumatic hammer has not been used for the purpose for interlocking the carton-blanks.

I secure said interlocking, by means of a simple and automatic device, which can be installed in existing standard machines of the well-known type, which cut and score and pile the blanks. In said standard machines, the cut and scored sheets of cardboard, each of which includes a carton-blank and waste-areas, are piled on a platform or table. Such piled sheets are removed from said platform or table, when the pile of such sheets has reached a selected height.

These standard machines are known to the trade under the names of "Miehle," "Miller," "Babcock," "Premier," etc. While these machines differ in details, they have the same essential operation and they are generally of the same type.

In the standard type of machine, the sheets are cut and scored, one by one. These sheets are rectangular, or of general rectangular shape.

The standard type of machine has a sheet-supporting platform or table. The cut and scored sheets are successively piled vertically upon said platform. Said table is automatically lowered, so that the top horizontal face of the pile is always in the same horizontal plane.

Said platform is vertically alined with the bottom of a space which is provided between four alining walls. One of these alining walls is held fixed against horizontal movement relative to said platform. The other three alining walls are horizontally movable relative to said platform. Said three movable alining walls are designated as jogging-walls.

These four alining walls are vertical and planar. Said four alining walls are arranged in two pairs, namely, a front alining wall and a rear alining wall, and two side alining walls. The alining walls of each pair are parallel to each other, and perpendicular to the alining walls of the other pair. Each movable jogging-wall is reciprocated in a horizontal direction which is perpendicular to the respective jogging-wall. Hence the four alining walls are always in rectangular formation.

The top sheets of the vertical pile are located at the level of the tops of said alining walls.

When the movable jogging walls have completed their respective jogging-strokes, the edges of the top sheets of the pile then abut the inner faces of the alining walls, so that each sheet is accurately vertically alined with all the lower sheets of the pile. Said alining walls can be of any desired height.

In the standard type of machine, there is a reciprocating delivery carriage, which delivers the cut and scored sheets, one by one, to the top of said pile. During the delivery-stroke of said delivery-carriage, the jogging-walls are moved in their reverse strokes, so as to enlarge the space between said four walls. After the respective cut and scored sheet has been delivered to the top of the pile, the three movable jogging-walls are moved in their respective jogging-strokes until the newly-delivered top sheet abuts the four alining walls. The jogging-walls are moved in their jogging-strokes, during the reverse movement of the delivery-carriage. These parts, and the mechanism for automatically operating the same, are well-known per se. U. S. Patent No. 618,992, dated February 7, 1899, shows standard jogging-walls or jogging-blades and standard mechanism for operating the same; U. S. Patent No. 631,392, dated August 22, 1899, shows a standard box-making cutter and scorer machine; U. S. Patent No. 970,366, dated September 13, 1910, shows

standard mechanism for feeding sheets to a receiving board which can be raised and lowered and joggers and mechanism for operating said joggers; U. S. Patent No. 1,089,342 shows a receiving table for receiving piled sheets, said table being automatically lowered; U. S. Patent No. 1,145,921, dated July 13, 1915, also discloses a receiving table for piled sheets, and means for automatically lowering said table so that the top sheet of the pile is maintained at the same height; U. S. Patent No. 1,421,868, dated July 4, 1922, also discloses joggers which are automatically operated; U. S. Patent No. 1,723,414 illustrates a machine for cutting and scoring blinks, combined with delivery means; and U. S. Patent No. 1,949,764, dated March 6, 1934, also shows automatic jogging means. Reference is made to these patents for features of construction and operation which are not specifically illustrated herein.

According to present practice, an operator must stand adjacent the sheet-supporting table, and manually interlock each sheet of cardboard which is delivered to the top of this pile, with the next lower sheet. This is done by downwardly pressing a selected part of the top blank, by means of the hand of the operator, without the use of a hammer or punch. This selected part of the top blank is a flap or the like, which is turnable relative to the body of the blank. Such manual interlocking is done at the edge of each successive sheet.

According to my invention, this slow and expensive manual labor is eliminated.

Numerous additional objects of my invention will be stated in the annexed description and drawings, which illustrate preferred embodiments thereof.

Fig. 1 is a perspective view of the essential parts of my device, applied as an attachment to the standard type of machine.

Fig. 2 is a detail view of the mechanism for actuating an indenting and interlocking hammer at a side jogging-wall, said hammer being shown in its non-operating position.

Fig. 3 is similar to Fig. 2, showing said hammer in its striking position.

Fig. 4 is a detail of the mechanism for actuating said hammer.

Fig. 5 is a front perspective view of a second embodiment, which is fixed to a jogging-wall. One or more said attachments made according to the second embodiment can be fixed to, or form part of, one or more jogging-walls.

Fig. 5 shows the parts in the respective positions in which they are held, while the respective jogging-wall is moving forwardly in its jogging stroke to its jogging or alining position. During said forward jogging movement of said jogging-wall, the indenting and interlocking hammer is held fixed, and said hammer is released only when a control device strikes against the pile of sheets.

Fig. 6 is a rear view of Fig. 5.

Fig. 7 is a rear view of the device, the parts being shown in their respective positions during the reverse movement of the jogging-wall before the setting arm is operated.

Fig. 8 is a detail view which illustrates the connection of clutch-collar 38 to stud-shaft 39*a*.

Fig. 9 is a top plan view of the clutch-collars 38 and 45.

My invention is shown as applied to the "Miehle" machine. Fig. 1 shows a front alining wall 11 and a rear alining wall 10. The front alining wall 11 is fixed against horizontal movement relative to the sheet-supporting platform (not shown), in the "Miehle" machine. The rear alining wall 10 is a movable jogging-wall. It is automatically reciprocated by the well-known mechanism, in a horizontal direction which is perpendicular to the parallel vertical walls 10 and 11. This "Miehle" machine has two side jogging-walls, which are not shown.

Fig. 1 shows the link 1*a*, which is operated in unison with the delivery-carriage (not shown). When said link 1*a* is operated in the direction of arrow 2, said delivery-carriage is operated forwardly towards the front wall 11, to deliver the successive cut and scored sheet to the top of the pile.

These movable jogging-walls and the mechanism for actuating them in their jogging-strokes and in their reverse strokes, are well-known and require no description.

Link 1*a* is pivotally connected at 3 to an arm 4, which is fixed to rock-shaft 5, which is mounted in bearings which are fixed to the stationary frame F of the machine.

Gear 6 is fixed to rock-shaft 5. Gear 6 meshes with gear 7, which is turnably mounted on a pin or stud-shaft which is fixed to a stationary frame-member of the frame F of the machine.

Gear 7 meshes with the teeth 8 of a rack-bar 9, which is slidably mounted in a suitable slide bearing which is provided in the frame F of the machine. Gear 6 does not mesh with teeth 8. Rack-bar 9 is parallel to the side jogging-walls, and it is perpendicular to walls 10 and 11.

Rack-bar 9 is reciprocated in the direction of its longitudinal axis, which is perpendicular to walls 10 and 11.

Rack-bar 9 has a cylindrical extension-rod 12*a*, which fits slidably in a bore of a guide-block 14, which is fixed to the respective stationary frame-member. A vertical bar 15 is fixed to extension-rod 12*a*. The rack-bar 9 can be optionally reciprocated by vertical bar 15, which is fixed to extension-rod 12*a*, or by bar 1. Extension-rod 12*a* is rigidly fixed to rack-bar 9, and vertical lug 1 is rigidly fixed to extension-rod 12*a*.

One or more respective collars 17 are fixed to rock-shaft 5. Each collar 17 is associated with a hub 18 of an indenting and interlocking hammer 20, which is fixed to its hub 18 by a shank 19. The shaft 5 passes through a bore of each hub 18. Each hub 18 is freely turnable on rock-shaft 5.

Each hub 18 is associated with a mutilated collar 21. Each collar 21 is fixed to its shaft 5.

A compression and torsion spring 22 is located between each collar 17 and its associated hub 18. The respective ends of each spring 22 are respectively fixed to the associated collar 17 and to the hub 18. Each torsion spring 22 urges the respective hammer 20 to move to strike the top of the pile of assembled sheets.

The cylindrical periphery of each mutilated collar 21 is cut away at its extension 21*a*, so that each extension 21*a* has the shape of a half-cylinder. Each hub 18 has a stop pin 23 which overlies the respective cut-away extension 21*a*.

In order to show the parts more clearly, Fig. 4 shows the stop-pin 23 spaced from the ends of extension 21*a*.

When the arm 4 and rock-shaft 5 and the hammer-punches, called hammers 20 are in their respective non-operating positions which are shown in Fig. 1, each stop-pin 23 abuts its respective stop-extension 21*a*. When the hammers

20 of the front and rear jogging-walls 10 and 11 are in the positions shown in Fig. 1, each movable jogging-wall is at the end of its reverse stroke.

While link 1a is moved in a direction which is opposed to the direction of arrow 2, namely, to the broken-line position which is shown in Fig. 1, the movable rear jogging-wall 10 is moved horizontally towards the stationary alining-wall 11, and the side-jogging walls are moved towards each other, thus alining the pile of sheets.

After the sheets have been vertically alined at the completion of the jogging-strokes, the hammers 20 strike the piled sheets at the top of the pile, thus indenting the newly-delivered top sheet by means of said hammers 20 at one or more selected areas, and thus interlocking said newly-delivered sheet to one or more of the next lower sheets of the pile. I can provide the shaft 5 with any desired number of hammers 20, which can strike the pile of sheets at waste areas of the sheets or at blank-areas of the sheets. Since the top horizontal surface of the top sheet is always in the same plane, the hammers 20 deliver their indenting and interlocking blows accurately. The mutilated extensions 21 provide sufficient relatively free turning movement between hubs 18 and shaft 5, in order to make allowance for irregularities in the height of the pile.

After the hammers 20 have struck the top of the pile, the shaft 5 can turn relative to hubs 18 through a small angle, while link 1a completes its movement from its full-line position to its broken-line position. This relative movement between shaft 5 and hubs 18 is provided by the mutilated or cut-away extensions 21a.

The teeth 8 of rack-bar 9 mesh with a gear 12, which turns on a pin or stud-shaft, which is detachably or adjustably connected to the frame F. I can use respective gears 12 of respective different pitch diameters, in order to adjust the attachment for sheets of respective different thickness. The gears 6 and 7 can also be replaced by gears of respective different pitch-diameters.

Gear 12 is fixed to a shaft 5a, which is provided with bearings in the frame F. The bearings of shafts 5 and 5a can be adjustably fixed to the frame F. Said shaft 5a is associated with said hammers 20 and also with the same auxiliary parts 22, 18, 23, 21a, 21, 17 which have previously been described. Hence the hammers 20 of shaft 5a are moved to striking position, simultaneously with the hammers 20 of shaft 5.

The teeth 8 of rack-bar 9 also mesh with a gear 25, which turns on a pin which is detachably or adjustably fixed to frame F. As shown in Figs. 2 and 3, a bevel-gear 26 is fixed to gear 25. Said bevel-gear 26 meshes with a bevel-gear 27, which is fixed to a rock-shaft 28, which is mounted in suitable bearings in the frame of the machine. Rock-shaft 28 is associated with a hammer 20, which is connected to said rock-shaft 28 by the intermediate parts previously described.

The hammers 20 of the three rock-shafts 5, 5a, and 28 therefore operate in the same manner, simultaneously to strike the top surface of the newly delivered sheet, while it is held in alined position by the four alining walls, thus indenting said newly delivered sheet, and interlocking said newly delivered sheet with one or more lower sheets of the pile of alined sheets. There is a slight dwell in the movement of the jogging-walls, when they reach their operative alining positions, and the hammers 20 strike the newly-delivered top sheet while it is held thus accurately alined.

Hammers 20 and their associated parts can be provided at each of the four alining walls.

The rock-shafts can be rocked through an angle of 180°, or through a smaller or larger angle. The force of the blow of each hammer can be determined only by its torsion spring 22, which can be set to exert any desired torsional force. That is, each collar 21 can be cut away sufficiently so that its extension 21a will not rigidly abut the respective pin 23, during or at the end of the striking movement. After the hammers 20 have struck the newly-delivered top sheet, the rock-shafts can turn relative to the hubs 18, during the remainder of the operative turning movements of said rock-shafts 5, 5a, and 28.

When each hammer 20 is in its non-operating position, the stop-pin 23 of each hub 18 will abut a respective face of the respective extension 21a, under the biasing force of the respective torsion spring 22, which can be maintained at any desired initial torsion. When the hammer 20 strikes the newly delivered top sheet, the respective rock-shaft can continue to turn relative to the hub 18, through an angle which is determined by the angle of the mutilated extension 21a. This angle may be sufficiently large so that the rock-shaft never exerts a positive force upon the hammer 20, during its striking movement or after its striking movement has been completed. This angle may be sufficiently small, so that before the rock-shaft has completed its turning movement, it will apply positive force to hub 18 when extension 21a abuts pin 23. The arms or shanks 19 can be resilient, in order to prevent breakage.

A counter-weight 29 is fixed to a shank 30 which is adjustably fixed to a sleeve 31, which is fixed to shaft 5a. This counter-weight 29 can counterbalance all or a part of the weight of hammers 20 of the shaft 5a. The shafts 5 and 28 can be similarly counterbalanced.

The embodiments of Figs. 5–7 shows an attachment which can be fixed to one or more of the movable jogging-walls. This attachment comprises walls 32, which are fixed to the respective movable jogging-wall. The walls 32 may be the vertical members 10a of the jogging-wall 10, for example.

Rock-shaft 33 is mounted turnably in walls 32.

As shown in Fig. 6, detent pawl 34 has a hub 35 which is fixed to rock-shaft 33. Said detent pawl 34 has a lug 37, which enters a ratchet-tooth recess in the cylindrical periphery of clutch-collar 38, when the hammer 20 is in the inoperative position shown in Figs. 5–7. Said clutch-collar 38 is turnable on a stud-shaft 39a, which is fixed to walls 32.

As shown in Fig. 8, the internal cylindrical periphery of clutch-collar 38 has a circumferential recess. A key 39b, which is fixed to stud-shaft 39a, is located in said recess. Hence clutch-collar 38 can turn relative to stud-shaft 39a, and said clutch-collar 38 is held against shifting along stud-shaft 39a. The angle of the free turning movement of clutch-collar 38, relative to stud-shaft 39a, can be 180°, or more or less than 180°.

Hammer 20 is fixed to arm 41, which is fixed to clutch-collar 38.

Collar 43 is fixed to stud-shaft 39a. One end of torsion spring 42 is fixed to collar 43, and the other end of said torsion spring 42 is fixed to clutch-collar 38. The torsion spring 42 urges the clutch-collar 38 to turn in the direction in which

hammer 20 must be moved, in order to strike the top of the pile of sheets. The clutch-collar 38 is held against turning in its operating stroke under the force of torsion spring 42, as long as the lug 37 of detent-pawl 34 engages the ratchet-tooth recess in the external cylindrical periphery of clutch-collar 38. Before fixing collar 43 to stud-shaft 39a, said collar 43 can be turned on stud-shaft 39a, until spring 42 has been subjected to suitable initial torsion. This is done while the clutch-collar 38 is held against turning.

As shown in Fig. 5, a return torsion and compression spring 39 has one end thereof fixed to collar 40, which is fixed to stud-shaft 39a. The other end of spring 39 is fixed to the clutch-collar 45, which is turnable and slidable on stud-shaft 39a. Before fixing collar 40 to stud-shaft 39a, said collar 40 is turned in order to subject the return spring 39 to initial torsion which exceeds the torsion of operating spring 42. After collars 43 and 40 have been turned in order to subject their respective springs 42 and 39 to the desired respective initial torsions, said collars 43 and 40 can be fixed to the respective walls 32. Spring 39 urges clutch-collar 45 to turn reversely, in the direction of arrow 38b. When clutch collar 45 engages clutch-collar 38, and said clutch-collars 45 and 38 are free to turn in unison on stud-shaft 39a, clutch-collar 38 is therefore turned reversely in the direction of arrow 38b, to move the hammer 20 away from the top of the pile of stock.

As shown in Fig. 7 and in Fig. 9, clutch-collar 38 has a cam-face 43a, and a tooth or shoulder 44.

The clutch-collar 45 has a cam-face 45a, and a shoulder or tooth 45c which can engage the shoulder or tooth 44 of the clutch-collar 38.

A resetting arm 46 is fixed to clutch-collar 45. This resetting arm 46 can be fixed in a plurality of different respective selected positions to clutch-collar 45. For this purpose, the cylindrical periphery of clutch-collar 45 may have a series of holes, and the inner end of resetting arm 46 may be inserted into a selected hole. The angle between arms 41 and 46 may be 180°, or more or less than 180°.

Latch-rod 48 is horizontally slidably mounted in one of the walls 32 and in a bearing 49a which is fixed to the respective wall 32 by any suitable means, not shown. A collar 49b is fixed to latch-rod 48. One end of a compression spring 47 abuts collar 49b. The other end of compression spring 47 abuts the respective wall 32. Hence compression spring 47 biases the inner end of latch-rod 48 towards the respective vertical face of clutch-collar 45. Said face has a single hole H. When the inner end of latch-rod 48 is located in hole H, clutch-collar 45 is held against turning in the direction of arrow 38a under the force of operating spring 39.

A horizontally slidable rod 47a passes through a hole in detent-pawl 34, and through a hole in a horizontal wall 48a, which is fixed to walls 32. A button 49 is fixed to the front end of rod 47a. A biasing compression spring 50 is mounted on rod 47a, between wall 48a and button 49. The ends of spring 50 respectively abut button 49 and wall 48a. A collar 51 is fixed to rod 47a, rearwardly of wall 48a. When button 49 is pushed rearwardly against the biasing force of spring 50, collar 51 will turn detent-pawl 34 rearwardly, until its lug 37 releases clutch-collar 38.

Spring 53 is maintained under compression by the stronger compression spring 50. The other end of compression spring 50 abuts the rear end of the head or button 49.

A collar 52 is fixed to rod 47a, rearwardly of detent pawl 34. The compression spring 53 is mounted on rod 47a, between collar 52 and detent pawl 34. Spring 53 biases detent pawl 34 to engage the ratchet-tooth recess of clutch-collar 38.

Fig. 7 shows the shoulder 45c of the clutch-collar 45 abutting the shoulder 44 of the clutch-collar 38, the slight clearance between said shoulders 45c and 44 being provided for clearness of illustration. The inner end of rod 48 then abuts the imperforate or unrecessed part of the respective planar face of clutch-collar 45, and said inner end of rod 48 is out of the hole H, which is then spaced angularly about 180° from said inner end of said rod 48, which operates as a stop rod or latch-rod.

Assume that resetting arm 46 is turned clockwise from its position shown in Fig. 7 to the position shown in Fig. 5. While resetting-arm 46 is thus turned, clutch-collar 38 will be held against turning movement by detent-pawl 34. Clutch-collar 38 cannot shift relatively to stud-shaft 39a, in a direction parallel to the axis of stud-shaft 39a. When clutch-collar 45 is thus turned in unison with arm 46, forwardly relative to clutch-collar 38, the cam surfaces 43 and 45a will shift clutch-collar 45 along stud-shaft 39a, towards collar 40. Such turning of clutch-collar 45 relative to clutch-collar 38, will therefore increase both the torsion and the compression of the return spring 39. When clutch-collar 45 is thus turned forwardly through a predetermined angle relative to clutch-collar 38, the inner end of rod 48 will enter hole H, thus holding clutch-collar 45 from turning reversely under the force of the reverse or return spring 39. The angle between the inner end of stop rod 48 and hole H, when stop-rod 48 is in the position of Fig. 7, may be any desired angle.

Fig. 5 shows the resetting arm 46 in its extreme forward position, and clutch-collar 38 and its hammer 20 in extreme rearward position.

Assume that when the parts are in said positions shown in Fig. 5, that detent pawl 34 is released from clutch-collar 38, by pushing button 49 rearwardly against the force of spring 50, thus pushing collar 51 rearwardly in unison with collar 52, until collar 51 abuts and pushes against detent-pawl 34, and said collar 51 thus turns detent pawl 34 to its releasing position.

Clutch-collar 38 will then turn forwardly in the direction of arrow 38a, until the shoulder 44 strikes shoulder 45c. Such forward turning movement of clutch-collar 38 relative to clutch-collar 45, will permit clutch-collar 45 to move along stud shaft 39a away from collar 40 and towards clutch-collar 38, thus releasing the inner end of stop-rod 48 from the hole H of clutch-collar 45. The reverse spring 39 will then turn both clutch-collars 45 and 38 reversely in the direction of the arrow 38b, until the parts are again moved to the position shown in Fig. 7.

The operation of the second embodiment is as follows:

Assume that the movable jogging-wall to which the device is attached, or of which the device is a part, is at the end of its reverse stroke. Detent pawl 34 then holds clutch-collar 38 against turning in the direction of arrow 38a. Resetting arm 46 is then in the forward position shown in Fig. 5. The respective inner end of latch-rod or locking-rod 48 is then located in

hole H, so that torsion spring 39 cannot turn clutch-collar 45 in the reverse direction which is indicated by arrow 38b. The cam-surfaces 43 and 45a hold clutch-collar 45 spaced at its maximum distance from clutch-collar 38, as shown in Fig. 5. The tooth 45c is spaced sufficiently forwardly relative to tooth 44, so that clutch-collar 38, when released from detent pawl 34, can turn in the direction of arrow 38a, during its full operating stroke, so that hammer 20 can strike the top of the pile of stock in order to indent the newly delivered top sheet, and to interlock said top sheet with one or more lower sheets.

The device is now moved forwardly. At or close to the completion of the jogging-stroke, button 49 strikes the pile of stock, which is held against shifting by said four alining walls, at this moment. The detent-pawl 34 is released, and the hammer 20 strikes the top of the pile of stock. At the completion of the blow of hammer 20, the teeth 44 and 45c are optionally slightly spaced, or they may contact. As the clutch-collar 38 is thus turned forwardly in the direction of arrow 38a, in the striking movement, the cam-surface 43a is moved relative to cam-surface 45a, so that clutch-collar 45 is free to move towards clutch-collar 38, under the force of compression spring 39, until rod 48 is released from hole H.

Spring 39 immediately turns clutch-collar 45 reversely in the direction of arrow 38b, thus turning clutch-collar 38 reversely, by means of the teeth 44 and 45c. The tooth 45c optionally always laterally overlies tooth 44. That is, when clutch-collar 45 has been turned forwardly to the maximum extent, relative to clutch-collar 38, in the direction of the arrow 38a, said tooth or shoulder 45c may or may not laterally overlie the tooth 44. The lateral direction is a direction which is parallel to the axis of the stud-shaft 39a. In any event, when the clutch-collar 45 is turned reversely by the torsion spring 39, the tooth 45c will always strike the tooth 44, either at the beginning of said reverse turning movement of the clutch-collar 45 or at a suitable time after the beginning of the reverse turning of the clutch-collar 45, so that clutch-collar 38 will always be rotated reversely, in the direction of the arrow 38b, by said reverse turning movement of the clutch-collar 45. The inertia of clutch-collar 45, and the friction of rod 48 in hole H, prevent the clutch-collar 45 from turning reversely sufficiently to reversely turn clutch-collar 38, until the blow of hammer 20 has been completed. Likewise, the teeth 44 and 45c may be angularly spaced, when the hammer 20 strikes the top of the pile, thus ensuring a full effective blow of said hammer. A suitable stop is provided for limiting the simultaneous reverse turning movement of the clutch-collars 38 and 45. For example, the lug 37 is provided with an upstanding lug 37a which will abut the shank or arm 41, when the predetermined reverse turning movement of the clutch-collars 38 and 45 has been completed. As soon as the predetermined reverse turning movement has been completed, lug 37 again engages the clutch-collar 38. The spring 42 is rewound to its original torsion by the stronger reverse spring 39, during said reverse movement.

The reverse movement of the jogging-wall now begins, or starts shortly before the completion of said reverse turning movement. During the reverse movement of the jogging-wall, the resetting arm 46 is in the upwardly inclined position which is shown in Fig. 7. During said reverse movement of the jogging-wall, the upwardly inclined resetting arm strikes a suitable stop (not shown) so that the resetting arm 46 and the clutch-collar 45 are automatically turned in the direction of arrow 38a, back to the position shown in Figs. 5 and 6, at or before the completion of said reverse movement of the jogging-wall. The device is thus automatically reset.

I have described preferred embodiments of my invention, but numerous changes and omissions and additions can be made without departing from its scope.

I claim:

1. As an addition to a machine which cuts and scores respective sheets and vertically piles the cut and scored sheets in a space in which the piled sheets are vertically alined by movable jogged means which are movable towards and away from alining position, the combination of indenting and interlocking means adapted to exert pressure on the top of said pile and to interlock the piled sheets, and automatic mechanism for operatively actuating said indenting and interlocking means when said jogged means are substantially in sheet-alining position.

2. A combination according to claim 1, in which said indenting means are mounted independently of said jogged means.

3. A combination according to claim 1, in which said indenting means are mounted on said jogged means.

4. As an addition to a machine which cuts and scores respective sheets and vertically piles the cut and scored sheets in a predetermined space, the combination of movable jogged-walls for vertically alining said piled sheets, a turnable shaft, an indenting and interlocking hammer fixed to said shaft, automatic means for operating said hammer to strike the top of the piled sheets when they are substantially alined by said jogged-walls.

5. A combination according to claim 4, in which said shaft is mounted independently of said jogged-walls.

6. A combination according to claim 4, in which said shaft is mounted on a jogged-wall.

7. As an addition a machine which cuts and scores respective sheets and vertically piles the cut and scored sheets on a support in a predetermined space, opposed jogged-walls which are parallel to each other and which are movable towards each other and away from each other, a rack-bar movable to-and-fro in unison with said jogged-walls, a shaft associated with each of said movable jogged-walls, each said shaft being meshed with said rack-bar by meshing means which turn said shafts in respective reverse directions when said rack-bar is actuated, indenting and interlocking hammers having shanks which are fixed to said shafts, the movement of said rack-bar being timed to strike said hammers against the top of the piled sheets to indent and to interlock the top sheets of said piled sheets when the spacing between said jogged-walls is substantially a minimum.

8. As an addition to a machine which cuts and scores sheets and vertically piles the cut and scored sheets, a movable jogged-wall, a stud-shaft fixed to said jogged-wall, a first clutch-collar turnably mounted on said stud-shaft and held against shifting on said stud-shaft in a direction parallel to the axis of said stud-shaft, an indenting and interlocking hammer, said hammer being fixed to an arm which is fixed to said first clutch-collar, a torsion spring means which urge said first clutch-collar to turn to move said ham-

mer to striking position to strike the top of said sheets when vertically piled, a movable detent mounted on said jogged-wall and movable to engage said first clutch-collar to hold it against turning under the force of said spring means, a movable release button movably mounted on said jogged-wall and located to strike the edge of the pile of stock substantially at the completion of the jogging stroke of said jogged-wall, said release button being operative to release said detent from said first clutch-collar when said release button thus strikes said edge of said pile, biasing means which bias said detent to engage said first clutch-collar, a second clutch-collar which is turnably and slidably mounted on said shaft, said clutch-collars having respective cooperating cam faces and respective shoulders, the shoulder of the second clutch-collar overlying the shoulder of the first clutch-collar in the direction of the axis of said stud shaft, said cam surfaces being operative to slide the second clutch-collar away from the first clutch-collar when the second clutch-collar is turned relative to the first clutch-collar in the direction of the striking movement of said hammer, a torsion and compression spring mounted on said stud shaft, said torsion and compression spring being stronger than said spring means and exerting a turning force on said second clutch-collar which is reverse to the direction of the force which is exerted by said spring means, said torsion and compression spring sliding said second clutch-collar towards said first clutch-collar, means adapted to turn said second clutch-collar in a direction reverse to the direction of the turning force of said torsion and compression spring, movable latch means mounted on said jogged-wall, said movable latch means being biased to releasably engage said clutch-collar only when it is slid a predetermined distance away from said first clutch-collar.

ALEXANDER PELIKAN.