

Jan. 20, 1953

N. GJOSTEIN

2,626,147

JOGGING DEVICE FOR PILED SHEETS

Filed June 9, 1949

2 SHEETS—SHEET 1

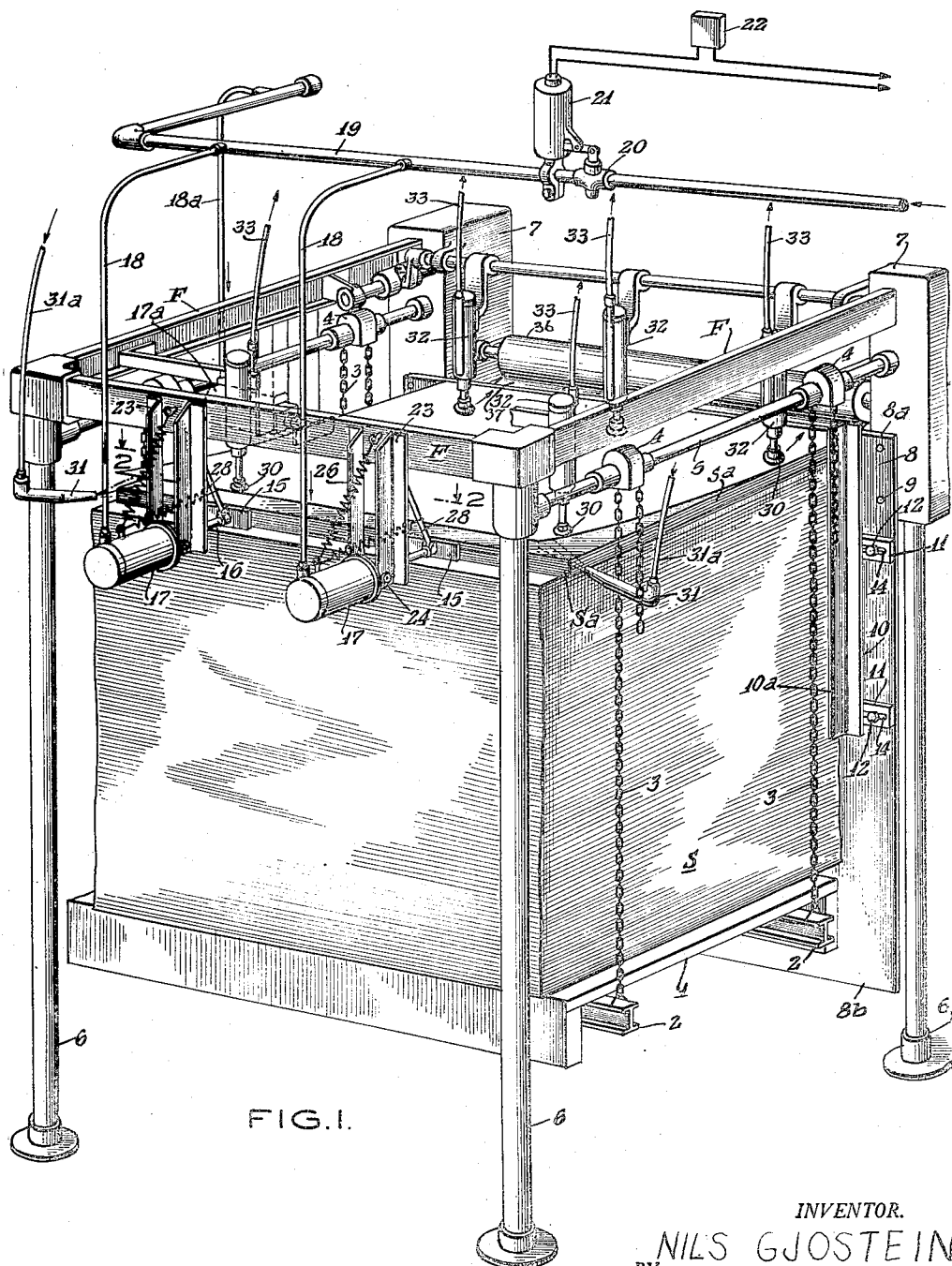


FIG. 1.

INVENTOR.
NILS GJOSTEIN
BY *Mock & Blum*
ATTORNEYS

Jan. 20, 1953

N. GJOSTEIN

2,626,147

JOGGING DEVICE FOR PILED SHEETS

Filed June 9, 1949

2 SHEETS—SHEET 2

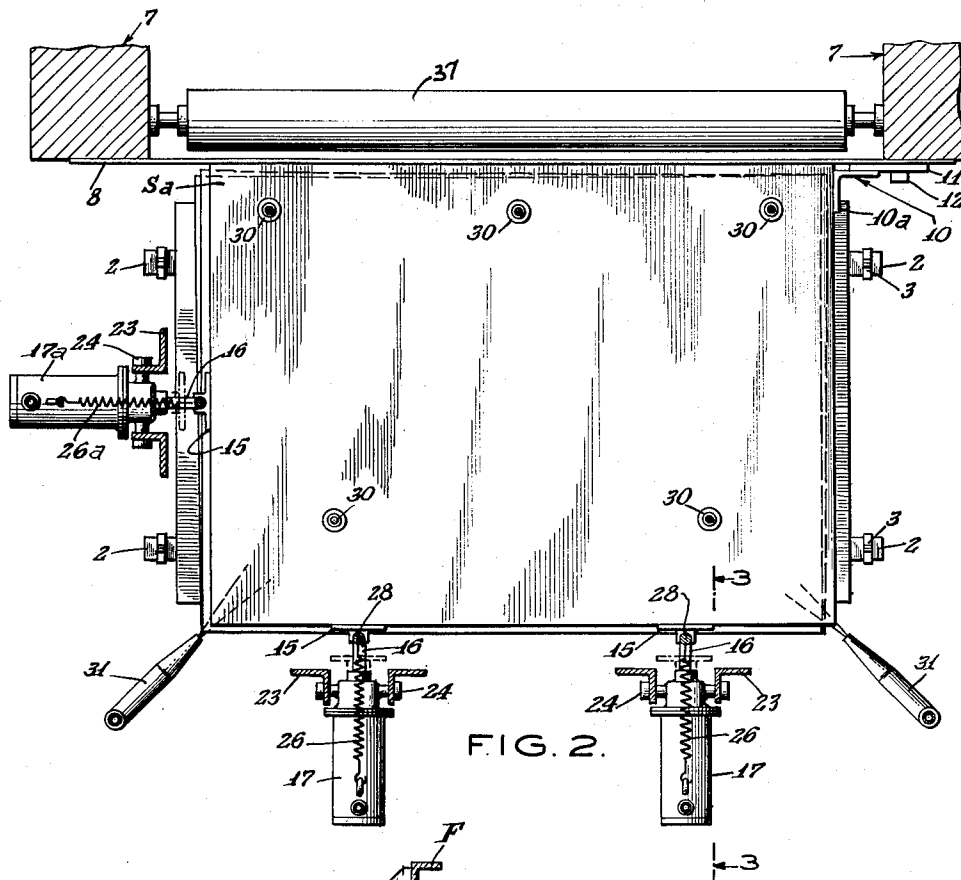


FIG. 2.

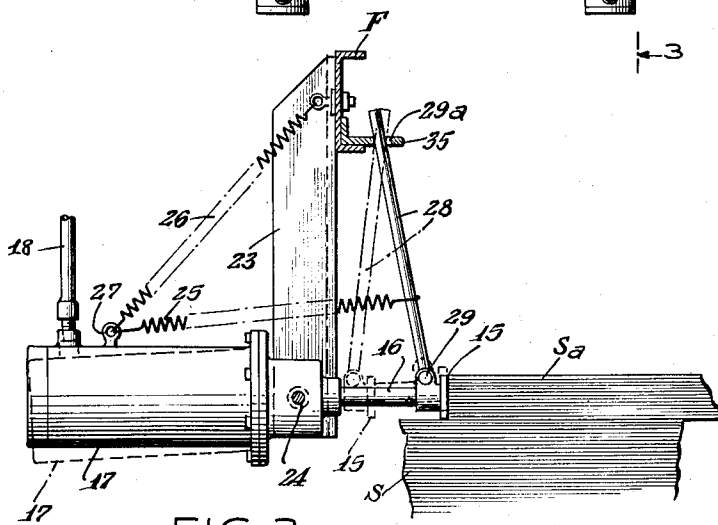


FIG. 3.

INVENTOR.
NILS GJOSTEIN
BY *Mock & Blum*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,626,147

JOGGING DEVICE FOR PILED SHEETS

Nils Gjostein, New York, N. Y., assignor to Federal Carton Corporation, North Bergen, N. J., a corporation of New York

Application June 9, 1949, Serial No. 98,051

5 Claims. (Cl. 271-8)

1

This invention relates to a new and improved registering device for automatically locating the top layer of a pile of sheets of cardboard or the like in proper alinement with their edges coincident with each other. More especially the invention is concerned with a registering device for preliminary alinement of the top layer of a pile of sheets in order to feed the sheets accurately from said pile, one by one, to mechanism by means of which certain subsequent operations, such as cutting and scoring, are performed on the sheets in order to form carton blanks therein.

It is well-known to provide feeding mechanism having arms provided with suction cups for lifting successive top sheets from a pile of sheets in order to successively feed the sheets to subsequent mechanism for cutting and scoring operations and the like. It is also well-known to blow air horizontally across and between the sheets in order to facilitate separation of the top sheet from the pile of sheets.

However, sheets of cardboard are commonly delivered from the mill on wooden platforms or skids in piles aggregating as much as 3,000 lbs. and the sheets are not disposed in proper alinement. It is therefore necessary to aline the sheets accurately for feeding purposes in some manner. Conventional feeding mechanisms usually include a vertical wall guide having a lateral flange by means of which the sheets may be alined with their corners fitting in the corner defined by the wall guide and its flange. The alinement of the sheets has proven to be a difficult and troublesome operation as a consequence of the great weight of the skid, the friction between the sheets and their natural adherence to each other. Furthermore, the manual alinement of the sheets is slow, time-consuming, expensive and generally inaccurate.

According to the present invention the sheets of the top layer of the skid are brought into the necessary alinement by means of simple and automatic mechanism which, moreover, may be conveniently installed on standard feeding devices such as are encountered in machines of the well-known type for cutting, scoring and filing blanks.

In order to aline the top layer of sheets, for example, a top layer three inches in height, a series of plungers is provided. These plungers are preferably actuated by air cylinders connected to an air line controlled by a single turning valve. The turning valve is actuated in order to admit air into the air cylinders during successive predetermined intervals, such as at intervals of one min-

2

ute or two minutes or the like. The air cylinders and plungers are so arranged that some plungers will be disposed in front of the pile of sheets while some plungers (at least one) will act on one side of the pile. When the turning valve admits compressed air to the respective air cylinders the plungers move in unison, so that the front plungers push rearwardly toward the guide wall while the side plunger or plungers push sideways or against the lateral guide-wall flange. At the completion of the respective strokes of the plungers the top layer of the pile is accurately alined. After the top layer of the pile has been aligned (the height of the aligned layer corresponding to the height of the plungers), the turning valve is actuated so as to exhaust the air from the air cylinders, whereupon the respective plungers are retracted.

The top sheets are removed, one by one, by the well-known mechanism and the alinement operation is repeated at predetermined intervals, so that the sheets in the top layer of the pile are always kept in perfect alinement for the feeding mechanism.

The foregoing features of the invention as well as additional objects and advantages of the invention will be readily apparent in the course of the following detailed description taken in connection with the accompanying drawings which illustrate a preferred embodiment thereof and wherein:

Fig. 1 is a perspective view of the alining mechanism applied to a standard sheet-feeding device;

Fig. 2 is a cross-sectional view taken on line 2-2 of Fig. 1; and

Fig. 3 is a cross-sectional view taken on line 3-3 of Fig. 2.

Fig. 1 illustrates a platform or skid 1 on which a pile of sheets S is mounted. This platform 1 is carried on supports 2 which are raised by means of chains 3; two of said chains being arranged on both sides of frame F. Each of said chains meshes with a sprocket located in a casing 4. Said sprockets (not shown) are fixed to a shaft 5 which is mounted in suitable bearings provided in the standards 6. The mechanism for rotating the shafts 5 and elevating the skid 1 is disposed within housings 7 and is not shown. Standards 6 support the frame F.

The top layer sheets Sa on skid 1 are alined by means of a vertical wall-guide or plate 8 having a top edge 8a and a bottom edge 8b. Said plate is made of any suitable rigid material and is fixed to the housings 7 as by means of screws 9. A lateral guide 10, such as an angle

3

iron, is preferably adjustably mounted on plate 8 by means of lugs 11. Clamping screws 12 pass through slots 14 of said lugs and adjustably secure angle iron 10 to plate 8 by being threadably engaged in tapped bores in said plate. Only a single lateral guide 10 is provided for aligning the sheets Sa and said guide is provided with a flange 10a extending perpendicular to plate 8.

Fig. 2 illustrates the topmost sheet of the top layer Sa in aligned position. The top sheets of the layer Sa are brought into proper adjustment or alinement when they fit angularly against both the plate 8 and the guide flange 10a. The top layer sheets Sa are pushed rearwardly against plate 8 by means of plungers 15 connected by means of piston rods 16 to pistons which are disposed in cylinders 17. Conventional return springs optionally aid in normally maintaining these pistons in their inner positions. Each cylinder 17 is provided with an inlet pipe 18 by means of which compressed air is supplied from a header 19 which is provided with a conventional air valve (not shown) disposed within casing 20.

Means are provided for automatically actuating the air valve of casing 20 in order to open the valve for predetermined intervals of time for admitting air under pressure into pipes 18 and air cylinders 17 and 17a. This means may conveniently take the form of a solenoid tripping switch 21. When said solenoid is energized the valve of casing 20 is operated and compressed air is supplied to the cylinders 17 and 17a to force their pistons outwardly against the force of said springs. Upon breaking the circuit to said solenoid the control valve in casing 20 is located so as to permit the air to be exhausted from the cylinders 17 and 17a. This valve is of the well-known two-way type which normally connects pipes 18 and the respective part of header 19 to the atmosphere. When said valve is operated, it shuts off communication between pipes 18 and the respective part of header 19 to the left of casing 20 and the atmosphere, and it connects header 19 to the source of compressed air. The electric circuit to the solenoid switch 21 is controlled by a time relay switch 22 or the like in order to maintain the plungers 15 in operative position for the required length of time. Other conventional inlet and outlet means may alternatively be provided for introducing and exhausting compressed air into and from air cylinders 17 and 17a.

An important feature of the invention resides in the mounting arrangement for the air cylinders 17 and 17a whereby the respective plates 15 may adjust themselves to adjust the contour of the unaligned edges of the top layer of the sheets to be aligned. Each of said cylinders is pivotally secured between a pair of supports or angle irons 23 depending from frames F, by means of trunnions 24. Of course, air supply lines 18, and 18a must be flexible to permit the slight pivotal movement of the air cylinders 17 and 17a. A return tension spring 25 serves to retract plunger 15 when the air is exhausted within the air cylinders. An additional tension spring 26 is secured at its lower end to a lug 27 of cylinder 17 and at its upper end to the frame F in order to counter-balance the weight of the cylinder 17 and the removable parts associated therewith. By reason of the described arrangement, it will be apparent that each of the air cylinders 17 and 17a will automatically adjust itself to the unaligned edge contour of the top layer sheets

4

Sa at the beginning of the stroke of the respective plungers 15 as it contacts said top layer sheets. This arrangement is necessary to accurately register the sheets Sa in aligned position against the vertical plate 8 and the lateral guide flange 10a.

In the operation of the device let it be assumed that the piston rod 16 is in the dotted line retracted position. The piston carrying this rod is, of course, at the rear end or left-hand end of the cylinder and the center of gravity of the cylinder, piston, and the parts attached to and carried by the piston, is correspondingly shifted. This will cause the center of gravity to lie to the left (in Fig. 3) of the trunnions 24, and the piston and parts relating thereto will assume the broken line position because of the greater tension exerted on the spring 26. At this time the stack of sheets will probably have their edges mis-aligned with an upper layer about opposite the broken line position of the plate 15. Upon the admission of air, the piston rod 16 will be protracted and as the piston and rod move to the right, the center of gravity of the combination will shift until the tension on the spring 26 causes the axis of the cylinder to lie horizontally. At about the time that this horizontal position is assumed, the plate 15 contacts the uneven edges of the upper layer of sheets shown at Sa, and the final movement aligns the mis-aligned edges and pushes the pile engaged by the plate 15 to the right. Under these conditions, the cylinder tends to tilt upwardly and the plate 15 engages on the top sheet of the remaining portion of the stack. If retracted under these conditions, the plate 15 would tend to pull the top sheet or sheets leftward, but as soon as retraction starts, the leftward shifting of the center of gravity in relation to the trunnion 24 raises the plate 15 slightly and sufficiently to ease contact between this plate and the top of the pile so that complete retraction of the plate may be made without disturbing the upper sheets of the stack S.

Fig. 2 illustrates the cylinder 17a disposed at one side of the frame F for positioning the top sheets Sa sideways against the flange 10a. Cylinder 17a and its associated elements are identical to those initially described for the front cylinders 17. Cylinder 17a has a tension spring 26a corresponding to tension spring 26 and also has a return spring 25a for the plunger 15, which latter spring corresponds to return spring 25. Each of the return spring 25 and 25a has one end secured to an arm 28 which is pivoted at 29 to an extension of plunger 15, the opposite end of the spring being fixed to lug 27 of the respective air cylinder. The upper end of the arm 28 is slidably received in a hole 29a formed in a fixed frame member 35. Arm 28 serves to guide plunger 15 forwardly in horizontal position, or in other words prevents angular rotation of the plunger about the longitudinal axis of the cylinder while simultaneously allowing pivotal movement of the cylinder about its trunnions 24. Cylinder 17a has an air line 18a which is connected to header 19 in the same manner as the air lines 18 for cylinders 17.

Suction cups 30 are provided for successively raising the topmost sheet of the top layer Sa after said top layer has been aligned. Each suction cup is provided with a suction cylinder 32, containing a piston (not shown) which is fixed to said suction cup in order to elevate the topmost sheet. Cylinders 32 are provided with air

5

lines 33 which are connected to a main suction line (not shown). Suction cups 30 operate in the well-known manner to successively raise the topmost sheets from the aligned top layer Sa and to feed said sheets to the feed rollers 36 and 37.

In order to facilitate the lifting action of suction cups 30, a pair of air nozzles 31 is provided for delivering a blast of air which serves to separate the topmost sheet from the top layer Sa. The two air nozzles 31 are provided with supply lines 31a and are required only at the exposed front corners of the top sheet, as shown, in Figs. 1 and 2.

Since certain modifications may be made in the device of the present invention without departing from the scope thereof it is intended that all matter contained in the foregoing description and shown in the accompanying drawing be interpreted merely as illustrative and not in a limiting sense.

What is claimed is:

1. Jogging means for alining the top layer of sheets in a stack of sheets, said jogging means comprising a support, an air cylinder which is pivotally attached to said support so as to be turnable in a substantially vertical plane, said cylinder tending to turn in one direction, spring means attached between said cylinder and said support and adapted to tend to turn said cylinder in the opposite direction whereby to tend to maintain said cylinder in a substantially horizontal position, a piston slidably disposed within said cylinder and extending out of one end thereof, the outer end of said piston having a transverse plate mounted thereon and normally positioned proximate to a side face of said top layer of sheets, and means for moving said piston outwardly so that said plate bears against said side face of said top layer of sheets, said cylinder tending to turn so as to maintain said plate in abutment with said side face during the outward movement of said piston.

2. Jogging means for alining the top layer of sheets in a stack of sheets, said jogging means comprising a support, an air cylinder which has a front end and a rear end, said cylinder being pivotally attached adjacent its front end to said support so as to be turnable in a substantially vertical plane and tending to turn in a counterclockwise direction, first spring means attached between said support and said cylinder intermediate its rear end and its point of attachment to said support, said first spring means tending to move said rear end of said cylinder in a clockwise direction around said point of attachment of said cylinder to said support whereby said cylinder is substantially horizontal, a piston slidably disposed within said cylinder and extending out of the front end thereof, a transverse plate attached to the outer end of said piston, a rod pivotally attached to said piston adjacent the outer end thereof, said rod being pivotable in a vertical plane, said support having an opening through which said rod extends loosely, second spring means attached between said cylinder and a point on said rod intermediate said hole in said support and the point of said pivotable attachment of said rod to said piston, said second spring means tending to move said rod toward said cylinder, a flexible air hose communicating with the interior of said cylinder between said piston and said rear end of said cylinder, and means for alternately forcing compressed air through said air hose into said cylinder, whereby to drive said piston outwardly, and permitting said compressed

6

air to escape from said cylinder through said air hose, whereby to permit said piston to retract, said piston in its retracted position having its plate positioned proximate to a side face of said top layer of sheets, said plate bearing against said side face while being moved to its outward position, said cylinder tending to turn so as to maintain said plate in abutment with said side face during the outward movement of said piston.

3. Jogging means for alining the top layer of sheets in a stack of sheets, said jogging means comprising a frame, a pair of supports depending from said frame, a cylinder trunnioned between said supports at a point adjacent one end of said cylinder, said cylinder being turnable in a vertical plane and tending to turn in a counterclockwise direction, a spring connecting said frame to a point on said cylinder between its other end and the point of attachment of said cylinder to said supports, said spring tending to move said cylinder in a clockwise direction whereby said cylinder is normally substantially horizontal, a piston slidably disposed in said cylinder and extending out of said one end thereof, said piston having a normal inward position in which it is proximate to and substantially transverse to a side face of said top layer of sheets, and means for moving said piston outwardly whereby it bears against said top layer of sheets.

4. Jogging means for alining the top layer of sheets in a stack of sheets and including a vertical support, a normally horizontal air cylinder having its forward end pivotally connected to said support, tension spring connecting the rear position of said cylinder to the upper part of said support and urging said rear end upwardly, a piston in said cylinder, a piston rod carried by said piston and projecting from the forward end of said cylinder, a head fixed on said rod and having a sheet contacting face perpendicular to the axis of said rod, means for moving said piston rod outwardly whereby said head bears against said top layer of sheets, said spring being so tensioned that the cylinder will lie in horizontal position upon the piston being protracted and with its rear end biased downwardly upon retraction of said rod, and spring means urging said rod to retracted position.

5. Jogging means for alining the top layer of sheets in a stack of sheets and including a vertical support, a normally horizontal air cylinder having its forward end pivotally connected to said support, tension spring connecting the rear position of said cylinder to the upper part of said support and urging said rear end upwardly, a piston in said cylinder, a piston rod carried by said piston and projecting from the forward end of said cylinder, a head fixed on said rod and having a sheet contacting face perpendicular to the axis of said rod, means for moving said piston rod outwardly whereby said head bears against said top layer of sheets, said spring being so tensioned that the cylinder will lie in horizontal position upon the piston being protracted and with its rear end biased downwardly upon retraction of said rod, a bracket extending from said support above said opening and having a horizontal leg provided with an opening, a rod extending loosely through said opening and having its lower end pivoted to said head, and a tension spring connecting the rear end of said cylinder to said last rod between said bracket and head.

NILS GJOSTEIN.

(References on following page)

2,626,147

7

REFERENCES CITED

The following references are of record in the
file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,693,928	Labombarde	Dec. 4, 1928

5

Number
1,961,366
1,993,919
2,072,667
2,128,316
2,265,617
2,401,592

8

Name	Date
Knowlton	June 5, 1934
Coe	Mar. 12, 1935
Coe	Mar. 2, 1937
Paul	Aug. 30, 1938
Yates	Dec. 9, 1941
Von Stocker	June 4, 1946