

Oct. 29, 1963

J. E. CLEMENS ETAL
APPARATUS FOR FEEDING SHEETS

3,108,799

Filed Jan. 16, 1961

3 Sheets-Sheet 1

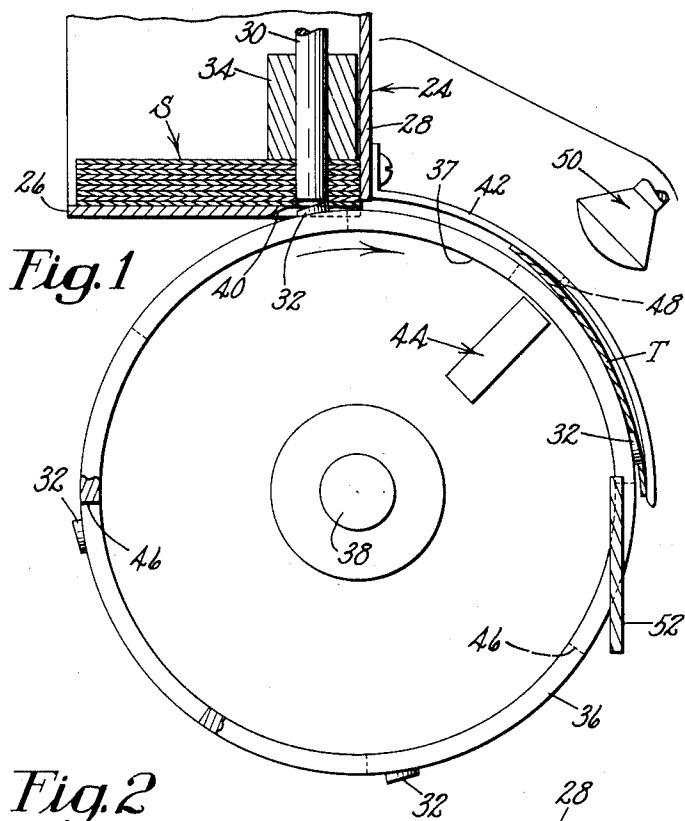


Fig. 1

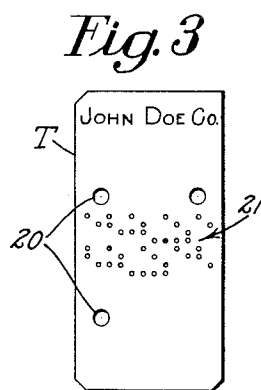


Fig. 3

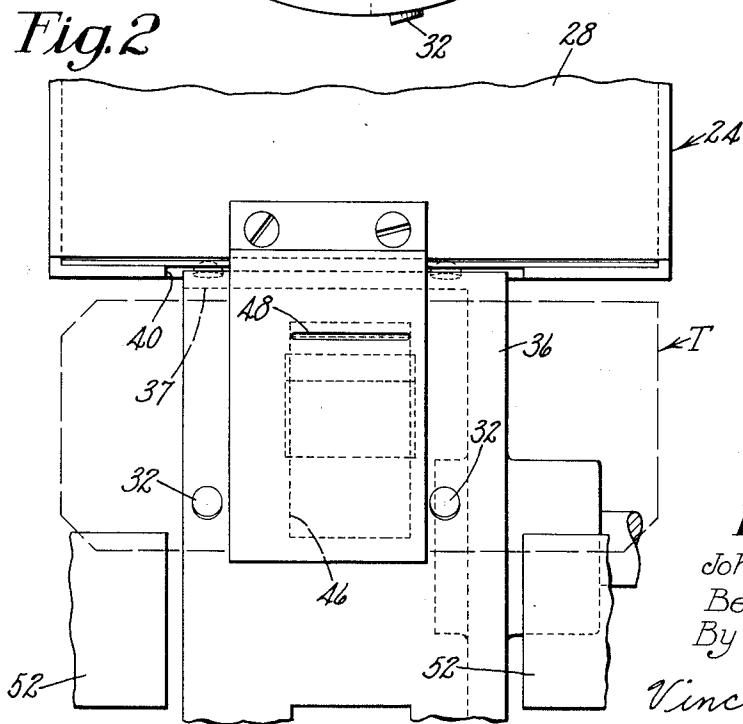


Fig. 2

Inventors
John E. Clemens
Ben B. Johnstone
By their Attorney
Vincent A. White

Oct. 29, 1963

J. E. CLEMENS ET AL
APPARATUS FOR FEEDING SHEETS

3,108,799

Filed Jan. 16, 1961

3 Sheets-Sheet 2

Fig. 4

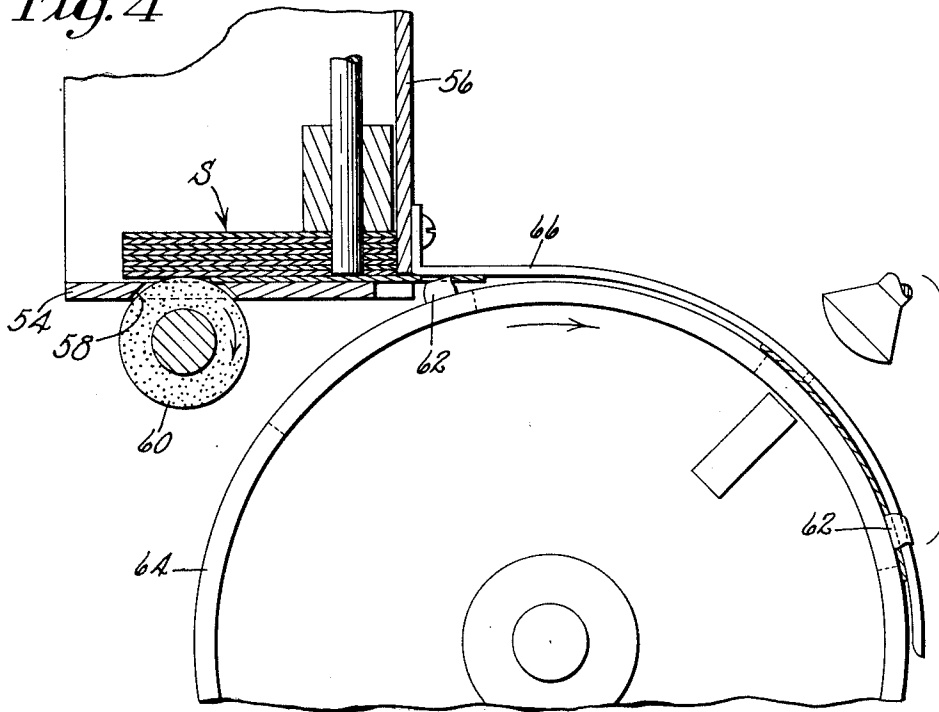
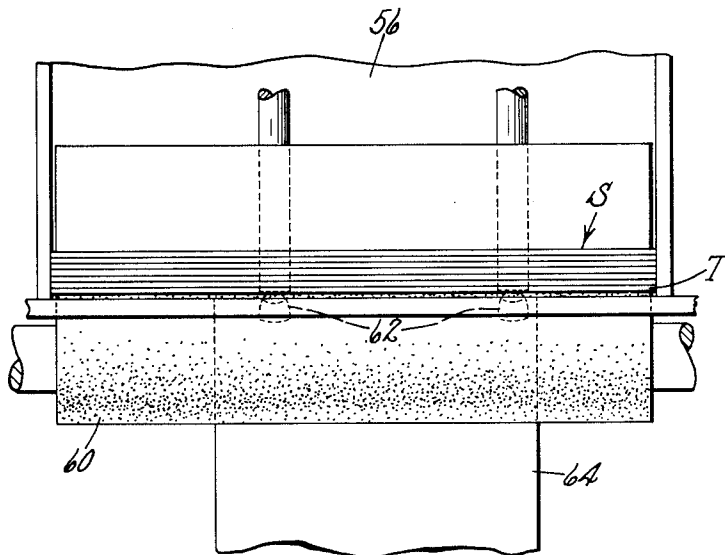


Fig. 5



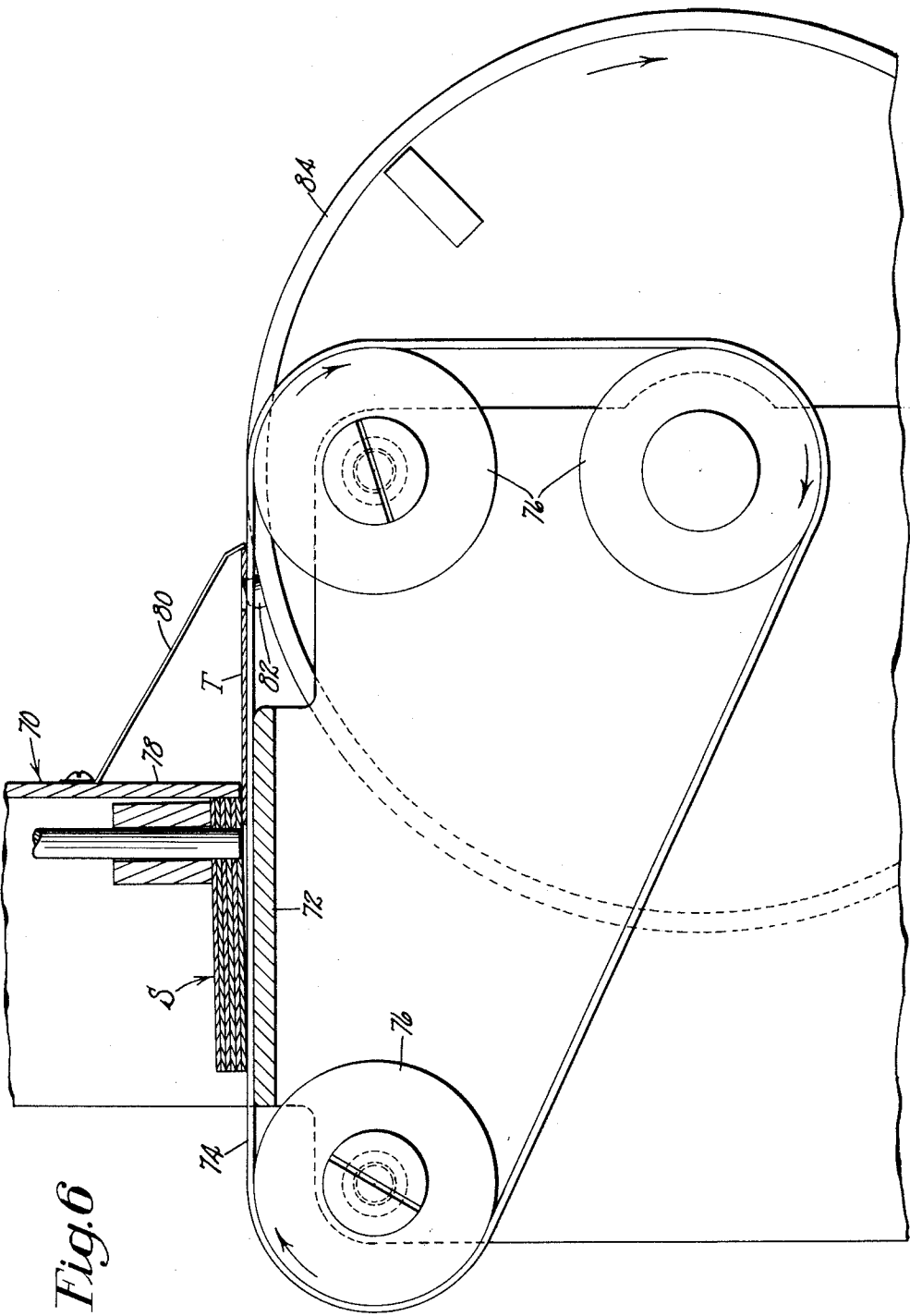
Oct. 29, 1963

J. E. CLEMENS ETAL
APPARATUS FOR FEEDING SHEETS

3,108,799

Filed Jan. 16, 1961

3 Sheets-Sheet 3



1

3,108,799

APPARATUS FOR FEEDING SHEETS

John E. Clemens, Xenia, and Ben B. Johnstone, Dayton, Ohio, assignors to A. Kimball Company, Brooklyn, N.Y., a corporation of New York

Filed Jan. 16, 1961, Ser. No. 82,763

8 Claims. (Cl. 271-41)

This invention relates to apparatus for feeding sheets. More particularly the invention is directed to devices for separating and feeding sheets in the form of records having locating holes therein.

The preferred form of the invention is shown as apparatus for feeding coded records in the form of perforated merchandise tags having locating holes which are accurately positioned with respect to fields of data indications. Apparatus has been developed as illustrated in U.S. Patent No. 2,704,186, issued in the name of K. J. Braun, for feeding and registering these tags by means of intermittently reciprocating feed pins. While such apparatus has found commercial acceptance the intermittent feed principles involved limit the apparatus to relatively low speed handling of tags. Modern data processing equipment having great capabilities of speed in processing requires that input devices for supplying data to be processed be capable of equally great speeds without sacrificing accuracy.

Accordingly, it is a general object of the invention to provide apparatus which is capable of feeding sheets in the form of records at high rates of speed while maintaining accuracy of registration with devices for operating on portions of the record. According to one feature the records, which are provided with at least two locating holes, are fed by continuously moving pins mounted for unitary movement in parallel circular paths intercepting the locating holes of successive individual records.

According to another feature, spindles are provided in a magazine to register all records in a stack by the locating holes with the path of movement of the feed pins.

According to a further feature, means are provided for orienting each record individually with the feed pin paths by moving each record from the magazine to a predetermined position where the locating holes are in said paths.

While the preferred form of the invention is shown in mechanism for handling tags, it should be understood that the various features of the invention are equally applicable to feeding any sheet having locating holes accurately related to an area of the sheet on which an operation is to be performed.

The various features of the invention will now be described together with novel details of construction and thereafter distinctly pointed out in the claims.

In the drawings,

FIG. 1 is a view in side elevation diagrammatically illustrating one form of the invention;

FIG. 2 is a front elevation of the mechanism shown in FIG. 1;

FIG. 3 illustrates a record in the form of a perforated merchandise tag;

FIG. 4 is a side elevation of a modification of the mechanism;

FIG. 5 is a rear elevation of the mechanism shown in FIG. 4; and

FIG. 6 is a side elevation of another modification of the invention.

Referring to FIG. 3, there is illustrated a record in the form of a merchandise tag T provided with locating holes 20 accurately located with respect to a field 21 of code indications. For stacking the tags in position for feeding, the apparatus is provided with a magazine 24 (FIGS. 1 and 2) having a bottom plate 26 on which a stack S of

2

tags rests. The front of the magazine is closed by a vertical plate 28 having its lower edge spaced above the bottom plate 26 to form a slot permitting edgewise passage of one tag at a time from the magazine. The magazine is further provided with spindles 30 adapted to pass through the locating holes 20 of all but the bottom tag in the stack for orienting the holes in the path of movement of feed pins 32. Also riding on the spindles 30 is a weight 34 adapted to press the stack of tags downwardly to ensure engagement of the bottom tag with the plate 26. It should be understood that when all tags are of the same size with the locating holes 20 in the same relative positions, it is unnecessary to provide spindles for orienting the tags, it then being sufficient to locate the tags by their edges in the magazine.

The feed pins 32 are mounted in aligned pairs which project radially from the periphery of a drum 36, with each pair being equally spaced around the periphery and separated by at least the width of the tags being fed. The drum is mounted for clockwise rotation as seen in FIG. 1 on a shaft 38 and is driven by means not shown. The bottom plate 26 of the magazine is provided with a slot 40 in the path of movement of the feed pins so that the feed pins may engage the locating holes of the bottom tag in the magazine. Referring to FIG. 1, it may be seen that the upper ends of the feed pins just clear the spindles 30 and engage only the bottom tag resting on the plate 26. Thus, it may be seen that clockwise movement of the drum 36 causes a pair of feed pins 32 to engage the locating holes 20 of the bottom tag in the magazine and feed the tag edgewise from the magazine along a circular path formed between the periphery of the drum and an arcuate plate 42 secured to the front of the magazine.

As the tag is fed along the circular path, it is moved past a sensing unit 44 which is received in a cavity 37 in the drum so as to underlie the field 21 of each tag fed. The drum adjacent each pair of feed pins is provided with openings 46, which underlie the field of code perforations 21 on a tag being fed by the feed pins. The arcuate plate 42 is provided with a narrow slot 48 which allows light to be directed from a lamp 50, through the slot 48, the code perforations 21 as they pass the slot and through the opening 46 in the drum to impinge on a plurality of light-responsive cells, not shown, in the sensing unit 44. As each tag is fed from the magazine, the next successive tag in the stack S drops on the plate 26 and into position where its locating holes 20 may be engaged by the next pair of feed pins 32. In this manner, successive tags are fed from the magazine past the sensing unit 44 and thereafter are stripped from the feed pins by stripper plates 52 at opposite sides of the drum 36.

FIGS. 4 and 5, illustrate a modification of means for orienting the records in the path of the feed pins. The magazine, somewhat similar to that shown in FIG. 1, is provided with a bottom plate 54 which is suitably spaced from a vertical front plate 56 of the magazine to provide edgewise passage of only a single tag. The bottom plate is provided with an opening 58 with clearance for the periphery of a feed roll 60 underlying the magazine so as to engage the bottom tag. The roll 60 is driven by means, not shown, in a clockwise direction, as seen in FIG. 4. By frictional engagement with the bottom tag, the feed roll 60 moves the tag to the right to the position shown in FIG. 4 where it may be seen that the tag has passed out of engagement with the roll. In this position the locating holes 20 of the tag are oriented in the path of movement of a pair of feed pins 62 extending radially from the periphery of a drum 64. The drum is rotated in a clockwise direction, as seen in FIG. 4, so that the feed pins 62 engage the locating holes of each suc-

3

cessive tag fed to said position and feed the tag along a circular path defined by the periphery of the drum 64 and by an arcuate plate 66 secured to the front of the magazine. Referring to FIG. 4, it may be seen that the bottom tag has been moved to the right into position where its locating holes may be engaged by a pair of feed pins 62, such movement allowing the feed wheel 60 to engage the next successive tag in the stack. This next tag, however, is held against movement from the magazine by the front plate 56, the lowermost tag at this time being in the tag slot. As soon as the lowermost tag is fed from the magazine by the feed pins, the next tag is free to drop fully onto the bottom plate 54 and into alignment with the tag slot. This tag then is free to move edgewise from the magazine and into position where it may be engaged by the next pair of feed pins.

FIG. 6 illustrates another modification of the invention in which a stack of tags is contained in a magazine 70. The bottom of the magazine is provided with a plate 72 over which runs one or more flat belts 74. In this modification it may be seen that the lowermost tag of the stack rests on the belts 74. The belts 74 are carried by a series of pulleys 76 which are driven clockwise, as seen in FIG. 6. The front plate 78 of the magazine is spaced above the belts 74 a distance sufficient to provide edgewise passage of only a single tag from the stack. The lowermost tag is moved by the belts 74 to the right until its leading edge engages a stop finger 80 which positions the tag in a predetermined position where its locating holes are oriented in the path of movement of feed pins 82. The feed pins are mounted on a drum 84 which is continually driven by a means not shown in a clockwise direction. As seen in FIG. 6, the tag T has its leading edge in engagement with the stop finger 80 with its trailing end within the magazine preventing feeding of the next successive tag from the magazine. The feed pins 82 engage the locating holes of the tag moving the tag beyond the stop finger 80 which yields sufficiently to allow the tag to be so moved. As the tag is fed by the feed pins, the next successive tag in the magazine is free to drop onto the belts 74 for movement from the magazine and into engagement with the stop finger 80.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. In apparatus for feeding sheets each having a pair of locating holes spaced across the sheet normal to the direction of feed; a transport wheel, a pair of feed pins projecting from said wheel and spaced axially thereof a distance equal to the spacing of a pair of said locating holes, a magazine for containing a stack of said sheets, and means including said magazine for positioning the bottom sheet of said stack longitudinally and laterally with respect to the axis of said wheel with its holes respectively in the rotational paths of said pins.

2. In apparatus for feeding sheets each having a pair of locating holes spaced across the sheet normal to the direction of feed; a transport wheel, a pair of feed pins projecting from said wheel and spaced axially thereof a distance equal to the spacing of a pair of said locating holes, a magazine for containing a stack of said sheets, said magazine being opened at one end to expose the locating holes of the bottom sheet of said stack and having a slot to permit edgewise passage of said bottom sheet, and means including said magazine for positioning said bottom sheet longitudinally laterally with respect to the axis of said wheel with its holes respectively in the rotational paths of said pins.

3. In apparatus for feeding sheets each having a pair of locating holes spaced across the sheet normal to the di-

4

rection of feed; a transport wheel, a pair of feed pins projecting from said wheel and spaced axially thereof a distance equal to the spacing of a pair of said locating holes, a magazine for containing a stack of said sheets and having an opening to permit edgewise passage of the bottom sheet of said stack, and means for moving said bottom sheet through said opening laterally with respect to the axis of said wheel to a predetermined position where its locating holes respectively are located in the rotational paths of said pins.

4. In apparatus for feeding sheets each having a pair of locating holes spaced across the sheet normal to the direction of feed; a transport wheel, a pair of feed pins projecting from said wheel and spaced axially thereof a distance equal to the spacing of a pair of said locating holes, a magazine for containing a stack of said sheets and having an opening to permit edgewise passage of the bottom sheet of said stack, spindles extending through the locating holes of the sheets of said stack to a distance short of said bottom sheet, and means for moving said bottom sheet through said opening laterally with respect to the axis of said wheel to a predetermined position where its locating holes respectively are in the rotational paths of said pins.

5. The invention according to claim 4; wherein said means for moving said bottom sheet to said predetermined position comprises friction means for urging said bottom sheet through said opening.

6. The invention according to claim 5; wherein yieldable means is provided to arrest said bottom sheet from movement by said friction means in said predetermined position.

7. In apparatus for feeding record sheets from a stack and processing said sheets, each sheet having at least one locating hole; a transport wheel, at least one pin projecting from said transport wheel, a data processing station adjacent said wheel, a magazine for containing said stack of said sheets in aligned relationship, said magazine being located with an aligned end sheet of said stack having said locating hole in the rotational path of said pin for engagement thereby and consequent movement of said end sheet from said magazine, and means for retaining a sheet removed from said magazine on said wheel with said pin engaging the hole of said sheet as said sheet is transported past said processing station.

8. In apparatus for feeding record sheets from a stack and processing said sheets, each sheet having at least one locating hole; a transport wheel, at least one pin projecting from said transport wheel, a data processing station adjacent said wheel, a magazine for containing said stack of said sheets, said magazine locating an end sheet of said stack with said locating hole in the rotational path of said pin for direct engagement thereby and consequent movement of said end sheet from said magazine, and means for retaining a sheet removed from said magazine on said wheel with said pin engaging the hole of said sheet as said sheet is transported past said processing station.

References Cited in the file of this patent

UNITED STATES PATENTS

976,640	Cowles	Nov. 22, 1910
1,680,863	Ford	Aug. 14, 1928
2,274,738	Potts	Mar. 3, 1942
2,789,819	Klotz	Apr. 23, 1957
2,809,032	Krag	Oct. 8, 1957
2,920,931	Goldfarb	Jan. 12, 1960
2,968,992	Billet	Jan. 24, 1961

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,108,799

October 29, 1963

John E. Clemens et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 12, for "fed" read -- feed --; line 66, before "laterally" insert -- and --.

Signed and sealed this 2nd day of June 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents