

June 8, 1937.

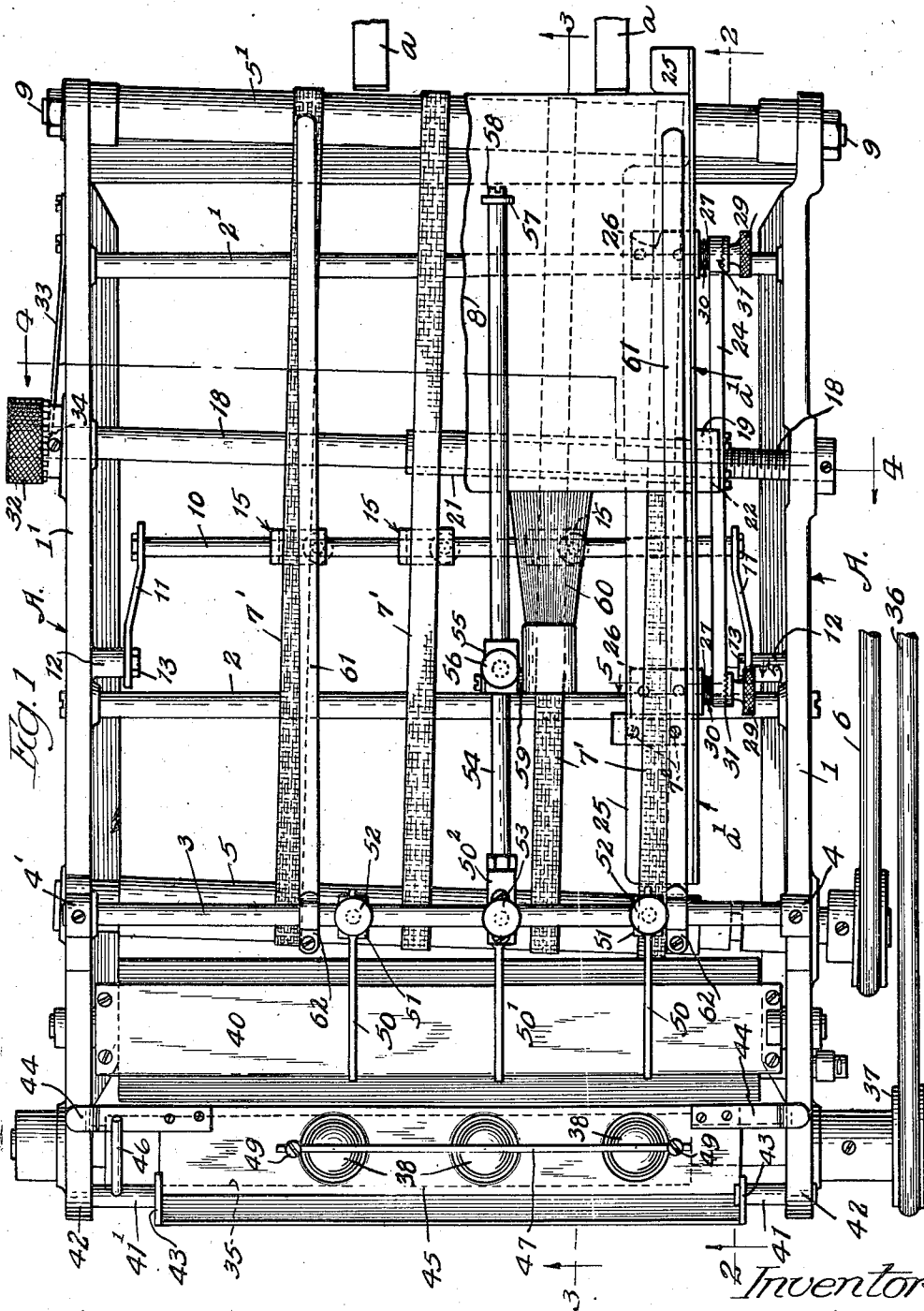
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2,083,296

BLANK CONVEYER BOARD

Filed Sept. 27, 1935

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

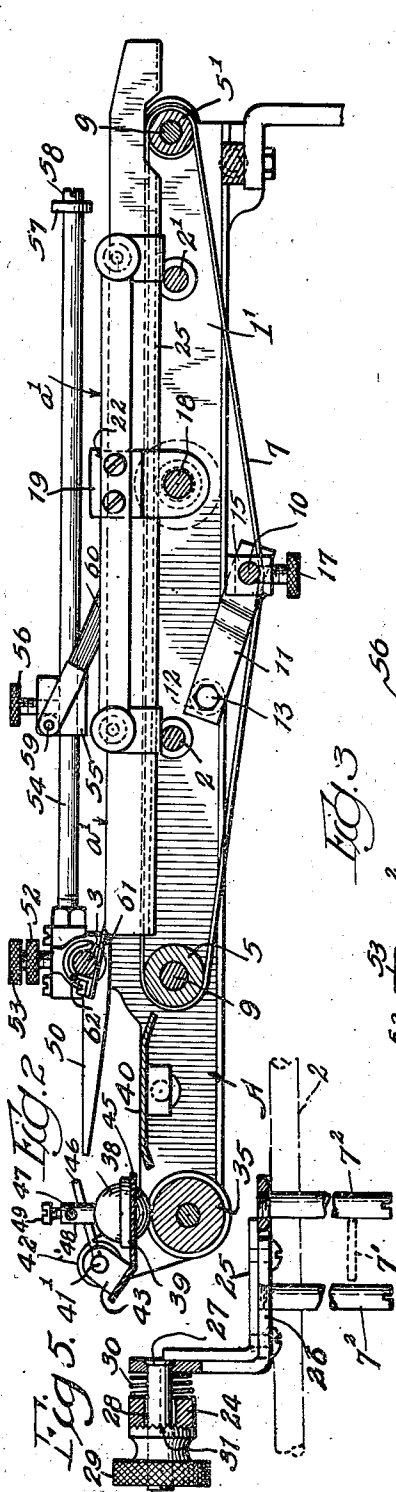


Fig. 5

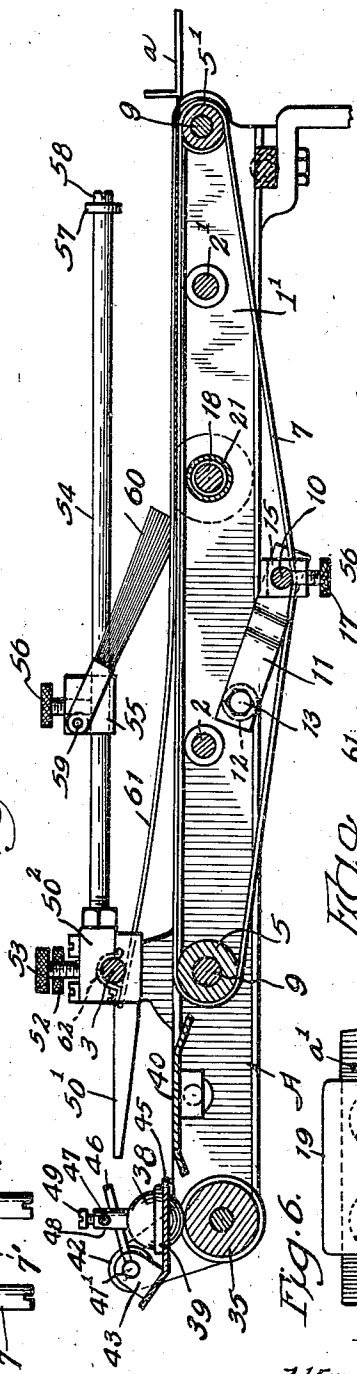


Fig. 6

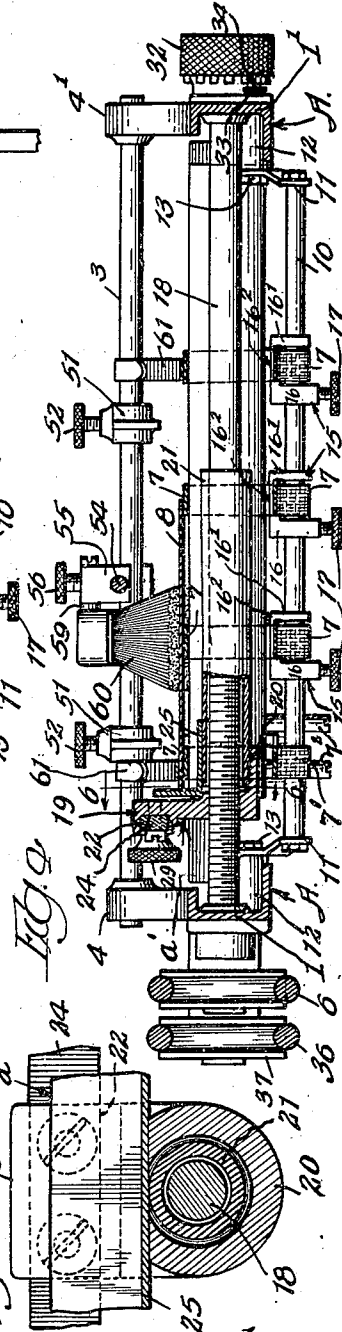


Fig. 7

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BLANK CONVEYER BOARD

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3 Claims. (Cl. 271-48)

This invention relates to conveyer boards particularly designed for delivering blanks from a blank separating machine to a primary machine in association with which said blank separating machine is operatively mounted, which for definite illustration we may assume is a commercially known form or type of printing press, particularly designed and adapted for office use; and relates particularly to the type of conveyer board in which register of fed blanks with the feeding and printing devices of the primary machine is effected by the use of diagonal tapes, acting in co-operation with a device which, appropriately, may be designated a register guide.

By the designation "blanks" as used herein, I include sheets of paper, cards, envelopes, book signatures, pamphlets and the like.

Among the objects of the invention are:

To provide a conveyer board of the type and for the purpose specified, which is simple and relatively inexpensive in construction, strong, durable and effective and dependable in operation;

To provide a conveyer board of the type and for the purpose specified, which comprises means for effecting both a coarse and, relatively, a very fine and accurate adjustment and alignment of the register guide relative to the printing and feeding devices of the primary machine, whereby practically perfect registration of fed blanks with said printing and feeding devices may quickly and conveniently be effected;

To provide for securing the register guide in different adjusted positions; and

To provide means for holding fed blanks in position on the conveyer board with their leading edges in contact with the stop fingers of the primary machine and in position for engagement by the feed devices thereof.

Other objects of the invention will also be apparent later.

To effect the objects thereof, a conveyer board embodying my invention and improvements, comprises the various features, combinations of features and details of construction hereinafter described and claimed.

In the accompanying drawings, in which the invention is fully illustrated,

Figure 1 is a top plan view of a conveyer board embodying my invention and improvements;

Figure 2 is a longitudinal, sectional side view on the line 2-2 of Fig. 1;

Figure 3 is a longitudinal, sectional side view on the line 3-3 of Fig. 1;

Figure 4 is a transverse sectional end view on the line 4-4 of Fig. 1; and

Figures 5 and 6 are enlarged, fragmentary detail views.

Describing the invention with reference to the drawings, in which, for purposes of convenient reference, A designates my improved conveyer board as a whole, which we will assume is operatively mounted between the discharge end of a blank separating machine, not shown, and the receiving end of a primary machine, only the stop fingers *a* of which—for timing delivery of fed blanks to the feed devices of said primary machine—are shown.

Excepting as regards features and details of construction, which hereinafter may be particularly described and pointed out, the conveyer board A is of a usual and well known type, and will readily be understood by persons familiar with such devices from an examination of the drawings, without a description thereof in any considerable detail.

Briefly, said conveyer board A, consists of side frames 1, 1', which are rigidly connected in desired spaced relation by transverse rods 2, 2'.

As shown, see particularly Fig. 4, the side frames 1, 1', are made in the form of channels and are assembled with their channelled sides facing inwards. As shown, also, said side frames 1, 1', are connected by a transverse rod 3, the ends of which are secured in holes formed in upwardly extending lugs or projections 4, 4', formed on said side frames 1, 1', preferably being formed integral therewith, the relation being such that said rod 3 will be spaced vertically from the blank supporting and feeding devices of said conveyer board. Supported on said rod 3 are certain devices, as hereinafter will be explained.

Rotatably mounted in bearings in the side frames 1, 1', of the conveyer board, are rollers 5, 5', to which, in operation, rotation is imparted by driving connection with a suitable source of power, as by a belt 6 adjusted to a pulley secured to the shaft of one of said rollers, as shown, to the shaft of the roller 5, and to a driven pulley on the primary machine, not shown, but as will readily be understood. Adjusted to the rollers 5, 5', are conveyer tapes or belts 7, by which rotating will be imparted to the roller 5' from the roller 5, and onto which separated blanks are delivered from the blank separating machine, and by which said blanks will be carried downwards along said conveyer board to effect contact of the leading edges thereof with the stop fingers

a, one of said blanks being indicated at 3, Figs. 1 and 4.

As shown, the rollers 5, 5', are made of suitable relatively light weight material—preferably wood—and are mounted by means of shafts 9, to which they are secured, said shafts being rotatably mounted in bearings in the side frames 1, 1', of the conveyer board, the relation being such that said rollers will be parallel with each other and their axes will extend diagonally of the conveyer board as shown, see Fig. 1, whereby fed blanks will be moved laterally to effect contact of corresponding edges of said blanks with a register guide, designated as a whole a', adjustably mounted on said conveyer board to provide for registering fed blanks with the feed and imprinting devices of the primary machine, as presently fully described, in a usual manner.

In what I now consider a preferable arrangement, the rollers 5, 5', are installed in such angular relation, that the tapes or belts 7, will extend at an angle of substantially three degrees (3°) to the center line of the conveyer board. However, within the scope and contemplation of my invention this relation may be varied as desired.

As shown, the tapes or belts 7 are subjected to desired tension in operation, by a tension device consisting, as shown, of a rod 10 secured in the ends of arms 11 pivoted to bosses 12 on the side frames 1, 1', of the conveyer board, best shown in Fig. 1, the bottom laps of said tapes running under said tension rod, and the arms 11 being adapted to be secured in positions corresponding to desired tension of the conveyer tapes or belts, by suitable means, as clamping screws 13, which extend through holes in the pivoted ends of said arms and have threaded engagement with holes formed in the ends of the bosses 12, as will readily be understood.

As shown, also,—excepting a tape 7' mounted in association with the register guide a', as presently described—the tapes or belts 7 are maintained in desired spaced relation and alignment, by suitable guides secured on the tension rod 10 with capacity for axial adjustment thereon. While the invention contemplates the use of any desired or approved form of guides for this purpose, what I now consider preferable guides consist of open-sided, substantially rectangular guide clips 15, each comprising end portions 16, 16', rigidly connected in spaced relation by an intermediate portion 16². The spaces between the end portions 16, 16' of said clips are sufficiently wide to receive the tapes or belts 7, and said end portions are provided with holes through which the tension rod 10 passes. Also, as shown, said clips are adapted to be secured to said rod in contemplated spaced relation by thumb-screws 17 which have threaded engagement with holes formed in the end portions 16 thereof, which are thicker than the end portions 16'.

In accordance with the present invention, the construction and operation of the register guide a' is as follows: Rotatably mounted against endwise movement in the side frames 1, 1', substantially parallel with the rollers 5, 5', to which the tapes 7, 7', are adjusted, is a rod 18, a section of which adjacent the side frame 1, is screw-threaded and has threaded engagement with a hole formed in a bracket 19, see Fig. 4. As shown, also, a hollow boss 20 is formed on the lower end of the bracket 19, secured in engagement with which is one end of a sleeve 21 which encloses the threaded end of the rod 18, the interior diam-

eter of said sleeve being sufficiently larger than the rod 18 to permit said rod to turn freely therein without binding.

At the upper end of said bracket 19 is a relatively thick portion, formed in which is a groove 22 secured in which, at about its longitudinal center, is a bar 24, on which the register guide proper 25 is operatively mounted.

As shown, said register guide proper consists of an angle bar made of thin sheet metal, preferably chromium plated, and the means for mounting said guide is as follows: Threaded, brazed, welded or otherwise secured to said register guide proper at opposite sides of the bracket 19, and in such positions that they will rest, respectively, upon the transverse rods 2, 2', or other fixed parts of the conveyer board, are angle plates 26, see Figs. 1, 2 and 5, secured in which are studs 27 which extend through holes 28 formed in the bar 24 adjacent its opposite ends, threaded to the outer ends of which, respectively, are thumb nuts 29, coil springs 30, which surround said studs 27 as guides, being inserted between said register guide proper and the bar 24, as clearly shown in said Figs. 1 and 5. Also, as shown, the register guide proper is adapted to be secured yieldingly in different adjusted positions by engagement of fine and, preferably, angular teeth formed on the nuts 29 and bar 24, as shown at 31, Figs. 1 and 5. Obviously, the shape in cross-section of the register guide proper 25 may be varied as desired, to meet conditions. Also while I consider the particular means shown for mounting said register guide proper as preferable, said mounting means—within the scope and contemplation of the invention—admits of a wide range of variation and modification.

Also, to provide for installing the register guide proper 25 in desired relation to fed blanks, substantially as shown in Fig. 4 of the drawings, in which, preferably, said register guide proper will rest upon the rods 2, 2', the top side of the hollow boss 20 is cut away so that it will form a surface positioned, substantially, in a plane tangent to the top sides of said rods 2, 2', as best shown in Fig. 6. As shown, said sleeve is threaded into said boss, but my invention contemplates the use of any desired and suitable means for this purpose.

As mounted for operation, the register guide a', together with the register guide proper, has capacity for a coarse adjustment by means of the rod 18, a portion of which, as stated, has screw-threaded engagement with a correspondingly threaded hole in the bracket 19; and, also, a very fine adjustment by means of the thumb nuts 29 threaded to the studs 27, and the springs 30. With the construction shown and described, the bar 24 will be rigidly supported in different adjusted positions, while opposite ends of the register guide proper 25 will be yieldingly supported and separately adjustable to provide for accurately aligning said register guide proper with the feed devices of the primary machine.

As shown, rotation of the screw-threaded rod 18 is effected by means of a knurled knob or handle 32 secured thereto, and which is adapted to be locked in different adjusted positions by a spring latch 33 secured to the side frame 1' of the conveyer board, a tooth on which is adapted to engage notched teeth on the knob or handle 32, as shown at 34, Figs. 1 and 4.

In accordance with the invention, the tape 7' mounted in association with the register guide a', instead of being manually adjustable—in the

manner of the tapes 7—is automatically adjustable with the register guide *a'*, by turning movement of the rod 18 to adjust said register guide transversely of the conveyer board A in one direction or the other, as may be desired. As shown, the means for this purpose consist of spaced pins 7² secured in the angle 26 adjacent the receiving end of the conveyer board, as installed for use, between which the bottom lap of the tape 7' passes—with only operating clearance, as best shown in Fig. 5.

In operation, blanks 8 delivered onto the conveyer board are first presented to a feed roller 35, to which rotation is imparted by driving connection with a suitable source of power, which we will assume consists of a belt 36 adjusted to a pulley 37 secured to the shaft of said roller 35, and to a driven pulley on the primary machine, not shown, but which may readily be supplied. Mounted in association with the feed roller 35 and co-operating therewith to feed blanks delivered thereto, are balls 38, said balls being mounted above said roller and running in contact therewith. As shown, said balls are loosely confined in holes or openings formed in a frame 39 supported above said roller 35, in a usual manner.

With the construction shown and described, it is obvious that said roller 35 and balls 38, will operate to feed blanks delivered thereto onto the feed tapes 7, 7', by which they will be carried downwards along said conveyer board and presented to the feed devices of the primary machine in association with which said conveyer board is mounted, the stop fingers *a*, see Figs. 1 and 3, operating to synchronize the movement of the blanks with the action of the feed and imprinting devices of said primary machine.

The register guide *a'* having been adjusted in the manner heretofore described, to bring the guide proper 25 into position to effect register of fed blanks with the feed and imprinting devices of a primary machine in association with which the conveyer board may be installed for use, it is obvious that, due to the convergence of the tapes or belts 7, 7', from the receiving to the discharge end of said conveyer board, towards said register guide proper 25, fed blanks 8 will be moved bodily towards the guide surface of said register guide proper until their proximate edges contact therewith.

In practice, the feed roller 35 is driven continuously, in operation, and at a sufficiently higher peripheral speed than the separator roller of the blank separating and feeding machine, that a preceding blank delivered onto the conveyer board will be presented to the primary machine in register with the feed devices *a* thereof, before the next succeeding blank is presented to the roller 35 by said blank separating and feeding machine, and the relation being such, also, that the feed devices of said primary machine having been actuated to feed a blank and the stop fingers *a*, having been moved into position to release a blank in the grip of the feed devices of said primary machine, will be returned to position to intercept the next succeeding fed blank, this sequence being repeated in continuous succession during operation.

As shown, the feed roller 35, the ball frame 39 and the pivoted plate 40—which we will assume is constructed and arranged to divert superposed blanks presented thereto—form parts of the conveyer board, but that said plate 40 is actuated and controlled to divert said superposed blanks

by means—as a caliper member—mounted on the feeder in association with the blank separating and feeding devices thereof, and operatively connected to said plate 40. However, said plate merely exemplifies any desired or approved form of deflector for the purpose, and may equally well be mounted on the feeder and form part thereof.

As shown, the frame 39 admits of limited turning movement on studs 41, 41' secured in upward extensions 42 on the side frames 1, 1', of the conveyer board and being fitted to bearings formed in lugs 43, which preferably form integral parts of the frame 39. As shown, also, the frame 39 is supported in operative position by arms 44 secured to opposite ends of the plate 45, which may be described as forming the body of the frame 39, said arms extending over and resting upon the side frame members 1, 1', of the conveyer board in position to confine the balls 38 in operative contact with the roller 35. As shown, also, raising movement of the frame 39 is limited by a rod 46 secured in one or the other of the studs 41, 41', and which projects into the path of movement of an arm 44 secured to the plate 45, the relation being such that, as limited, the frame 39 will prevent disengagement of the balls 38 from the cage or frame 39, and will confine said balls in operative contact with the roller 35.

As shown, the balls 38 are confined in engagement with the holes or openings in the plate 45 forming part of the frame 39, by a rod 47 supported on the plate 45 above said balls, as by posts 48 provided with holes in which the ends of said rod 47 are secured, as by a set screw 49.

In operation, fed blanks are guided from the roller 35 onto the tapes 7, 7', by the plate 40 and fingers 50, 50', supported on the rod 3, and which project over said plate, the undersides of said fingers, as shown, diverging from said plate away from said rod. In the preferable construction shown, the fingers 50 are secured to the rod 3 by means of heads 51 formed thereon, said heads being provided with holes to receive said rod and being secured in desired adjustment thereon by set screws 52.

As shown, also, the finger 50', is formed on the lower member of a head 50², which is split through the axis of the hole through which the rod 3 passes and is adapted to be clamped to the rod 3 by screws 53, as shown.

Also, secured to the upper member of the head 50², as by screw-threaded engagement with a hole therein, is a rod 54, which projects from said head towards the delivery end of the conveyer board and in spaced, substantially parallel relation to the plane defined by the top laps of the feed tapes 7, 7', mounted on which, so as to be adjustable lengthwise thereof, is a head 55. As shown, said head is provided with a hole slidably fitted to said rod, and is adapted to be secured in adjusted positions thereon by a set screw 56. As shown, disengagement of the head 55 from the rod 54 is prevented by means of a disk 57, the diameter of which exceeds that of said rod, and which is detachably secured to the outer end thereof, as shown by a screw 58, which extends through a hole in said disk and has threaded engagement with a hole formed in the end of said rod.

Pivoted to the head 55 by means of a stud 59 with its bristles extending in the direction of the discharge end of the conveyer board and resting on one of the feed tapes 7, 7', is a brush 60. In operation said brush is mounted on the rod 54 in such position that the ends of the brush bristles

ties will rest against the following edges of fed blanks when the leading edges thereof are in contact with the stop fingers *a* of the primary machine, whereby said blanks will be prevented from bouncing backwards—away from said stop fingers—as might occur should said blanks hit said fingers when moving with any considerable speed and with said blanks unrestrained. Obviously, also, said brush will operate to hold fed blanks in contact with the belts or tapes *7* with a light pressure which will insure feeding of said blanks downwards along the conveyer board without exerting any appreciable frictional resistance to movement of said blanks with the feed tapes.

As shown, also, fed blanks are held in frictional engagement with the feed tapes *7, 7'*, by straps *61*, corresponding ends of which are secured to the rod *3* and which extend from said rod downwards along the conveyer board, preferably terminating only a short distance from its discharge end, and which overlie the feed tapes *7, 7'*. Also, in what I now consider preferable construction, the straps *61* are secured in frictional engagement with the rod *3*, the relation being such that by turning the attached ends of said straps on the supporting rod *3* in one direction or the other, the pressure thereof on fed blanks may be increased or decreased, as desired, to meet different operating conditions.

As shown, the means for securing said straps to said rod *3*, consists of spring clip *62* adjustably secured to said straps, as by screws, and which extend over said rod, said clips being so shaped and proportioned that when drawn into close engagement with said rod, the friction between said clips and rod will support said straps in different positions corresponding to desired pressure thereof on the fed blanks.

While I consider the embodiment of the invention herein shown and described as desirable and preferable, I do not desire to limit the invention or the protection of the patent thereto, as within the scope and contemplation of my invention I desire to extend the protection of the patent to any construction or arrangement which comes within the appended claims.

I claim:

1. In a conveyer board for the purpose specified, the combination of a frame, blank feeding means mounted thereon comprising feed rollers, including a driven roller, tapes adjusted to said rollers, a register guide for effecting alignment of fed blanks with associated devices, comprising a register guide proper, means for adjusting said register guide proper transversely of the conveyer board, and spaced projections which depend therefrom, between which the feed tape proximate said register guide passes.

2. The conveyer board specified in claim 1, and means for operatively mounting the register guide proper comprising a rod rotatably mounted in the conveyer board frame, a portion of which adjacent the register guide is screw-threaded, a bracket provided with a screw-threaded hole which the threaded portion of said rod engages, a hollow boss on the lower end of said bracket, a sleeve an end of which is secured in said hollow boss and which encloses the screw-threaded end of said adjusting rod, the inside diameter of said sleeve being sufficiently larger than the adjusting rod to permit turning movement thereof without binding.

3. The conveyer board specified in claim 1, and means for operatively mounting the register guide proper comprising a transverse rod rotatably mounted in the conveyer board frame, a portion of which adjacent the register guide is screw-threaded, a bracket provided with a screw-threaded hole which the threaded portion of said rod engages, a hollow boss on the lower end of said bracket, a sleeve an end of which is secured in said hollow boss and which encloses the screw-threaded end of said adjusting rod, the inside diameter of said sleeve being sufficiently larger than the adjusting rod to permit turning movement thereof without binding, and the top of said hollow boss being cut away substantially in the plane defined by the underside of the register guide proper, as installed for use.

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