United States Patent

Morton

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[54] ARCUATE STACKER

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[52] **U.S. Cl.** .....**271/88,** 214/6 H, 271/74

[51] **Int. Cl.** **B65h 31/10,** B65h 31/26

[58] **Field of Search**.....271/87, 74, 68, 63, 86, 88, 271/71; 214/6 C, 6 H, 6.5

[56] **References Cited**

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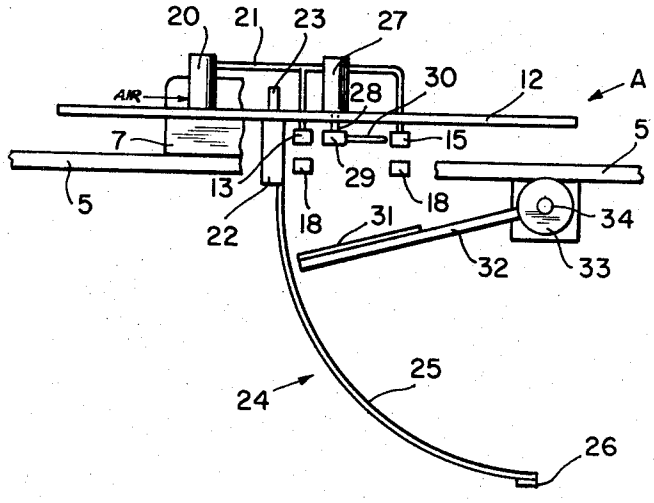
[57] **ABSTRACT**

This invention is directed to a stacker for garment work pieces in which each work piece is fed to an arcuate receiver by controlled air jets and is deposited in the receiver by a mechanical presser bar against the resistance of a radially disposed movable table carried by a radial arm concentric with the receiver.

6 Claims, 4 Drawing Figures



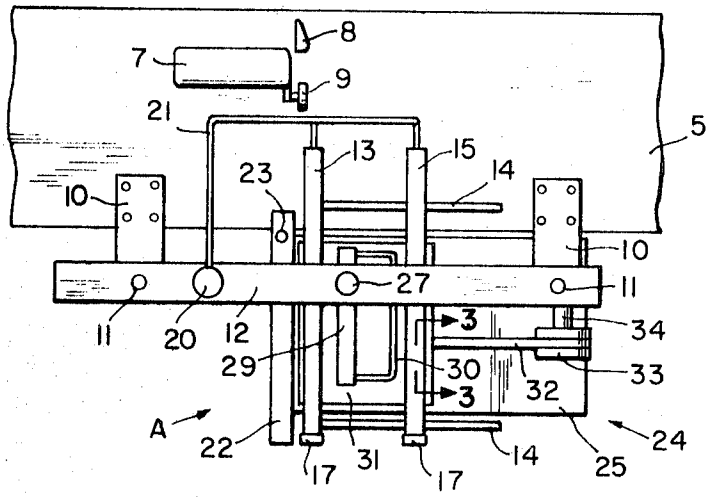


FIG. 1

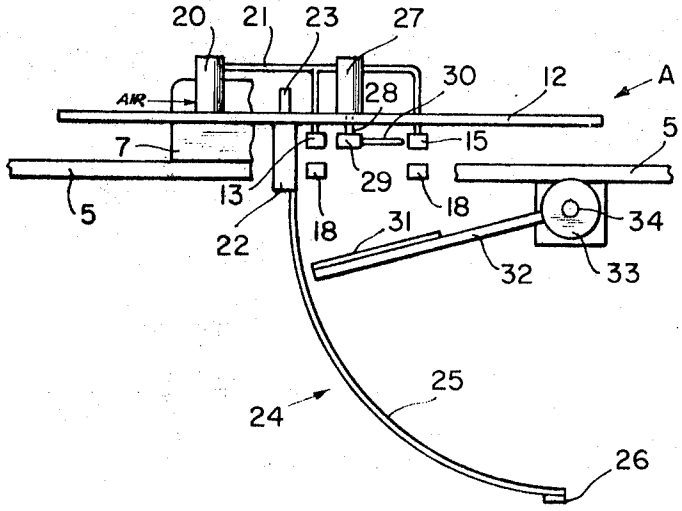


FIG. 2

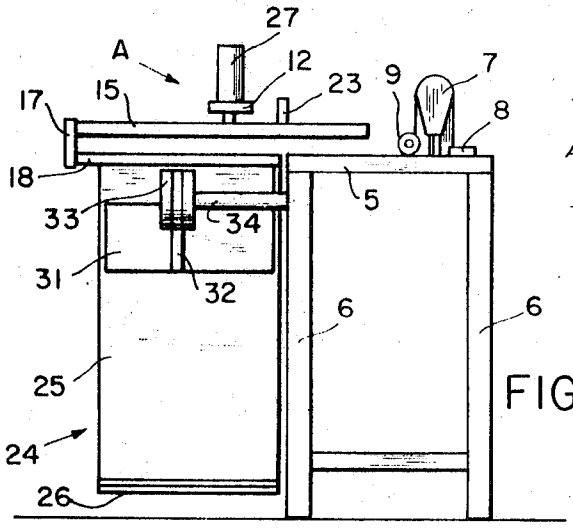


FIG. 4

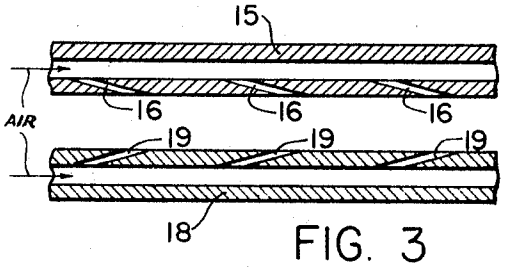


FIG. 3

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ARCUATE STACKER

This invention relates generally to new and useful improvements in stacking devices for garment work pieces and particularly seeks to provide a novel machine for arcuately stacking a large number of work pieces, especially the type having one edge thicker than its other edges.

Heretofore, known types of stackers generally have formed vertical stacks or piles of work pieces and, when used with work pieces having one thick edge, are severely limited in capacity due to the thickness buildup along the zone of the thick edges. Such prior stackers seldom could hold more than about two dozen pieces per stack even if the supporting table therefor was tilted in an effort to offset the effect of the thickness buildup. However, a stacker constructed in accordance with this invention can accommodate up to about 75 dozen pieces per stack with all of the pieces retained under perfect control. Therefore, one object of this invention is to provide a high-capacity stacker for garment work pieces each having a thick edge.

A further object of this invention is to provide a stacker of the character stated in which the work pieces are fed individually from a sewing machine to an arcuate receiver that is associated with a radial supporting table moveable through a path concentric with the receiver.

A further object of this invention is to provide a stacker of the character stated in which each successive work piece is fed by air jets to a position overlying the top of the receiver and is then mechanically inserted into the receiver.

A further object of this invention is to provide a stacker of the character stated in which the operation of the air feed jets is controlled photoelectrically.

A further object of this invention is to provide a stacker of the character stated in which the radial supporting table is moved to successive stack support positions as successive work pieces are introduced into the arcuate receiver.

A further object of this invention is to provide a stacker of the character stated that is simple in design, rugged in construction and economical to manufacture.

With these and other objects, the nature of which should become apparent, the invention will be understood more fully by reference to the drawings, the accompanying detailed description and the appended claims.

In the drawing:

FIG. 1 is a top plan view of a work piece stacker constructed in accordance with this invention;

FIG. 2 is a rear elevation thereof;

FIG. 3 is an enlarged fragmentary section taken along line 3—3 of FIG. 1 and shows the relative arrangements of the air jets, and

FIG. 4 is a left end elevation thereof.

Referring to the drawing in detail, the invention (as illustrated) is embodied in a stacker for a multiplicity of garment work pieces and includes sewing table **5** supported by a plurality of legs **6**. Sewing machine **7** is operably affixed to table **5** so that the direction of work piece feed is from front to rear. Folding shoe **8** is located at the front of sewing machine **7** in order to fold the edge of a work piece into a hem as it enters the sewing machine for stitching. Driven feed wheel **9** is located at the rear of sewing machine **7** in alignment with the hem of the stitched work piece and serves to advance the work piece toward the feed elements of a stacker assembly (generally indicated A) mounted to the rear of sewing table **5**.

Stacker assembly A includes a pair of spaced rearwardly extending support arms **10,10** having their forward ends secured to the rear edge portion of the sewing table **5**. The rear end of each arm **10** is provided with an upstanding post **11** which together support horizontal bar **12** in a plane above that of the top of the sewing table and in spaced parallel relation to the rear edge thereof.

A first tubular air feed element **13** is secured beneath bar **12** in general alignment with the hemmed edge portion of the work piece and slightly above the plane of the top of sewing table **5**. The front end of feed element **13** overlies a substantial portion of the rear section of the sewing table and the rear end

of the feed element **13** extends rearwardly beyond the rear edge of the sewing table a distance substantially equal to the length of the work piece.

Feed element **13** is provided with a pair of laterally extending spaced parallel rods **14,14** that adjustably support a second tubular air feed element **15** identical with feed element **13**. The bottoms of the feed elements are provided along their full lengths with a multiplicity of spaced downwardly and rearwardly extending apertures **16** (see FIG. 3) that serve as air jets to move or feed the work piece rearwardly when air under pressure is introduced into the interior of the feed elements.

The rear end of each of the feed elements **13** and **15** is closed by a depending abutment plate **17**, each of which cantileverly supports a tubular bottom rail **18** that extends forwardly into proximity with the rear edge of sewing table **5** and in a plane at or slightly below that of the top of the sewing table. If desired, the tops of rails **18** may be provided with upwardly and rearwardly directed apertures **19** to assist in feeding of the work piece when air under pressure is introduced into the interior of the rails.

A solenoid controlled air valve **20**, mounted on top of bar **12** supplies air through hoses **21** to the feed elements **13** and **15** on a cyclic basis as will be hereinafter described more fully. The same valve **20** controls the supply of air to rails **18** whenever they are perforated to assist in the feeding function of feed elements **13** and **15**.

A head bar **22**, affixed beneath bar **12** carries photoelectric cell **23** which is located adjacent the rear edge of sewing table **5** for sensing the passage of a work piece being advanced by feed elements **13** and **15** (and possibly rails **18**). The beam from cell **23** is normally uninterrupted. However, when a work piece is advanced by the feed dogs of the sewing machine **7** and feed wheel **9** to the point at which the rear (leading) edge of the work piece interrupts the cell beam, it actuates air valve **20** to admit air to feed elements **13** and **15** to continue the advance of the work piece to a position overlying the upper end of an arcuate receiver generally indicated **24**.

Receiver **24** simply is a metal plate **25** bent into a uniform quadrant of a circle with its upper end secured to head bar **22** and its lower end secured to bottom bar **26** affixed to the frame of the sewing table.

As the work piece is advanced by the air feed elements to a position overlying the top of receiver **24**, its front (trailing) edge will clear the beam from photoelectric cell **23** which then becomes effective to shut off the air supply to the feed elements and simultaneously causes a single cycle operation of air cylinder **27**. Piston **28** of cylinder **27** carries at its lower end a press bar **29** having a laterally extending U-shaped removable press frame **30**, which together force the work piece downwardly through and beneath rails **18** into receiver **24**.

The successive work pieces become stacked on table **31** secured to the outer end of radial arm **32**, the inner end of which is operably affixed to adjustable friction hub **33** mounted on shaft **34** carried by the frame of the sewing table. The drag of hub **33** determines the resistance against movement of table **31**. Thus, as each successive work piece is introduced into the top of receiver **24**, press bar **29** will force it against any previously deposited work pieces on table **31** and transmit the depositing pressure through the accumulating stack of work pieces to table **31** and advance same incrementally in a downward direction until a complete stack has filled the receiver.

Plates **17** not only serve to close the ends of tubular elements **13**, **15** and **18** but also serve as abutments to limit the rearward feed of the work pieces and thus assure their proper registry with the top of receiver **24**.

If narrow work pieces are to be stacked it is only necessary to remove the U-shaped press frame **30** and close the gap between elements **13** and **15** to the distance required. Rail **18** that is dependent from feed element **15** obviously will move with that element.

It is believed to be clear from the foregoing description that it is the use of a quadrant receiver and a radially supported

and moveable table that enables the stacking of a large number of work pieces, each having a thick edge at the extremity of the radius and a thin surface and edge toward the center of the radius.

When receiver **24** becomes completely filled, the entire unit is stopped until the receiver is emptied and is then restarted.

I claim:

1. A stacker for garment work pieces including a receiver, means for supporting a garment work piece at the entrance to said receiver, means for feeding a work piece onto said supporting means, and means for positively displacing said work piece from said supporting means into said receiver, and said receiver including an arcuate plate of uniform curvature disposed with its axis parallel to the direction of feed of said work piece and in which said work piece displacing means operates in a direction that is substantially parallel to a tangent at the entrance to said receiver, said receiver additionally including a radially oriented table for supporting a stack of successively deposited work pieces and incrementally moveable through an arc concentric with said arcuate receiver plate.

2. The stacker of claim **1** in which said work piece feeding means includes at least one air jet feed element overlying the plane of travel of said work piece in proximity thereto and extending from a position ahead of said receiver to a position

overlying the entrance to said receiver.

3. The stacker of claim **2** additionally including means for initiating operation of said work piece feeding means as the leading edge of said work piece is directed toward said receiver and for discontinuing operation of said work piece feeding means as said work piece registers with the entrance to said receiver.

4. The stacker of claim **3** in which said work piece feeding means comprises a pair of spaced parallel air jet feed elements overlying the plane of travel of said work piece in proximity thereto and extending from a position ahead of said receiver to a position overlying the entrance to said receiver, and in which said work piece supporting means comprises a pair of spaced parallel rails underlying said air jet feed elements and spaced therefrom a distance sufficient to permit passage of a work piece therebetween, said displacing means being effective to move said work piece downwardly between said rails.

5. The stacker of claim **4** in which said spaced parallel rails are also air jet feed elements.

6. The stacker of claim **4** additionally including means for varying the spacing between said air jet feed elements and the spacing between said rails.

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