United States Patent

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[54] **GARMENT STACKING APPARATUS**
2 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **112/121.29,** 271/84
[51] **Int. Cl.** **D05b 33/00**
[50] **Field of Search** 112/121.29, 121.11, 121.12, 121.15, 2, 252; 271/54, 84, 85, 63, 8; 198/24, 221; 214/1.4, 1.7

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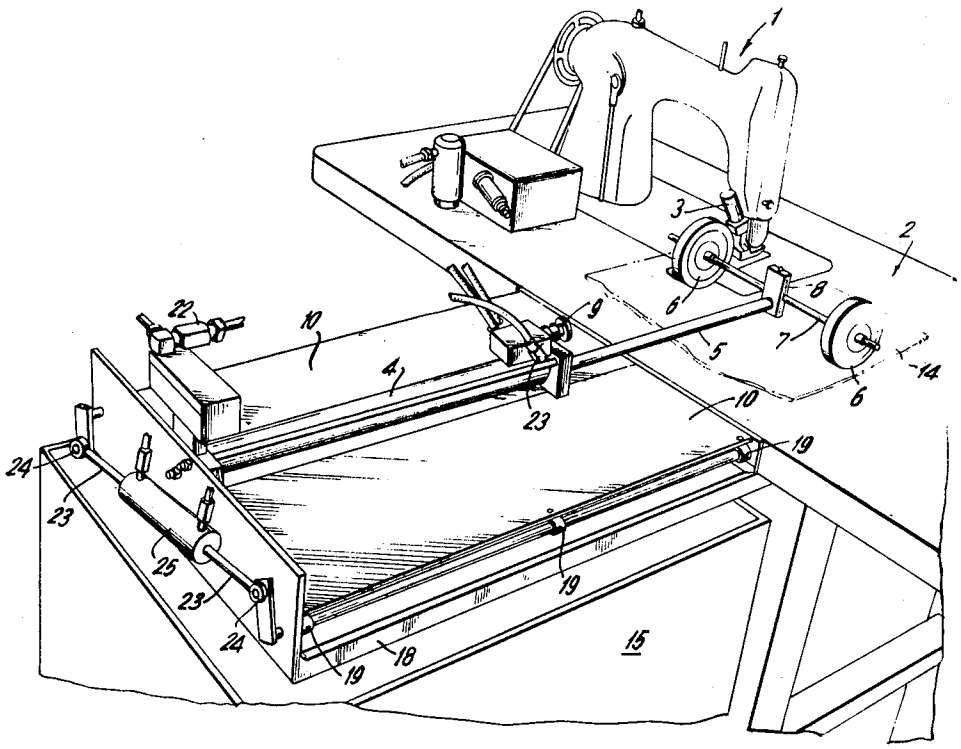
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ABSTRACT: This disclosure describes an apparatus for removing garments from a sewing machine after the sewing operation has been completed and stacking the garments thus removed in a predetermined place. Once the garment passes the sewing portion of the sewing machine, a sensor may be provided to activate means to remove the garment from the sewing machine and which also may activate means to sever the thread. The garment is then brought onto a pair of doors which when opened allow the garment to fall through and be deposited in a stack which can then be conveniently moved for further operations.



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SHEET 1 OF 2

FIG. 1

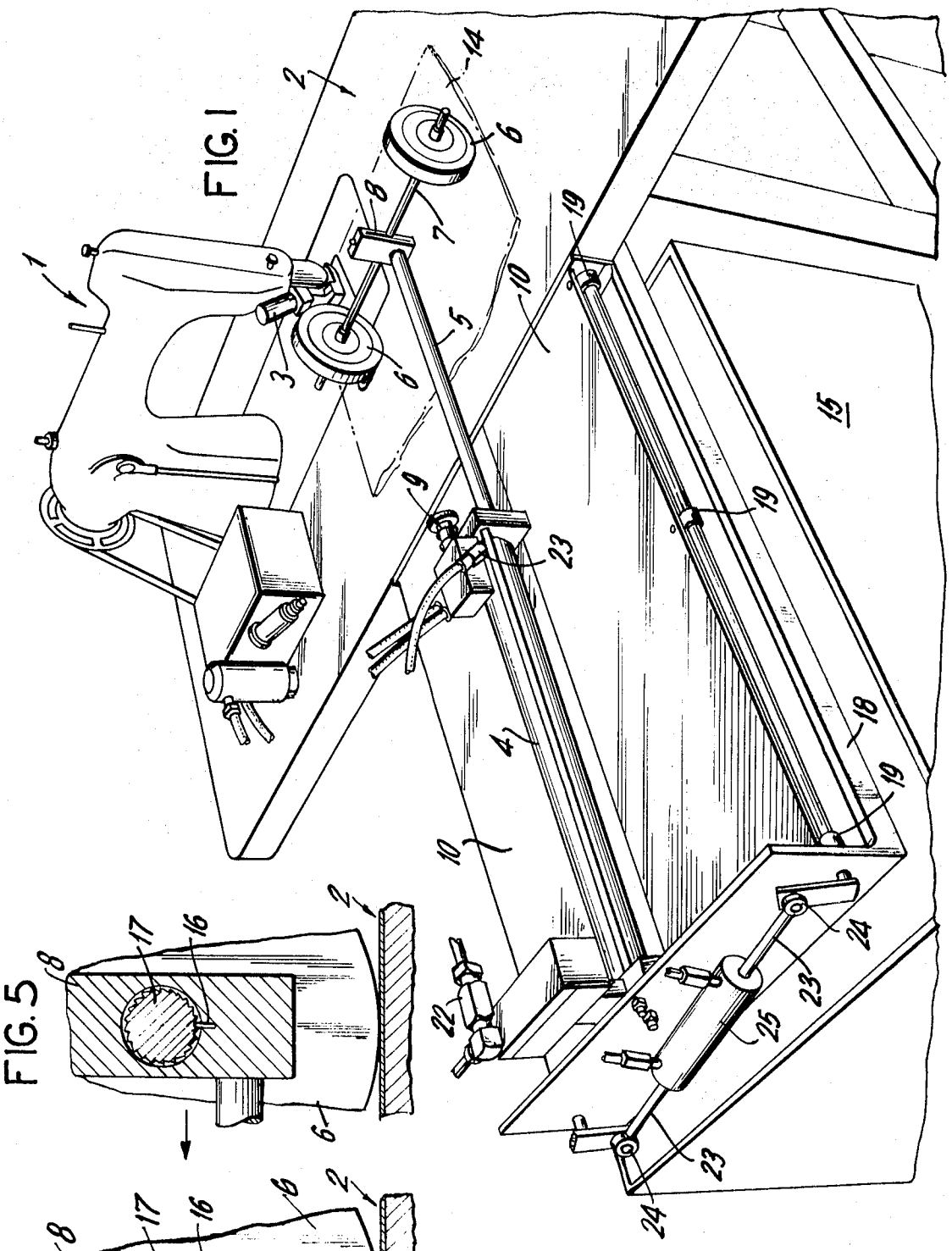
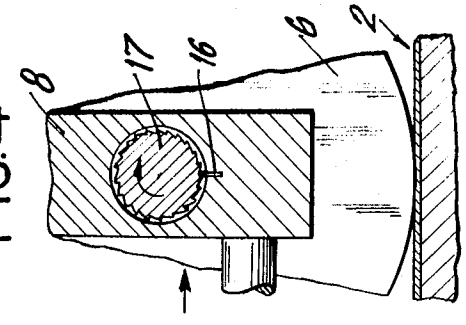


FIG. 5

FIG. 4



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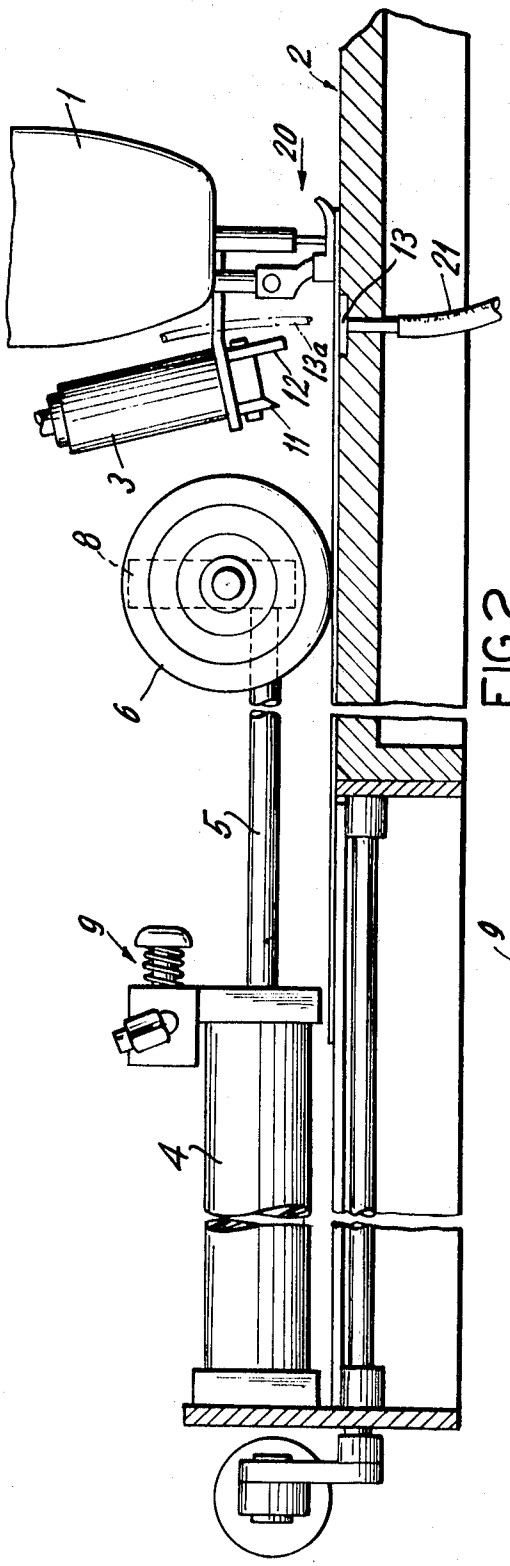


FIG.2

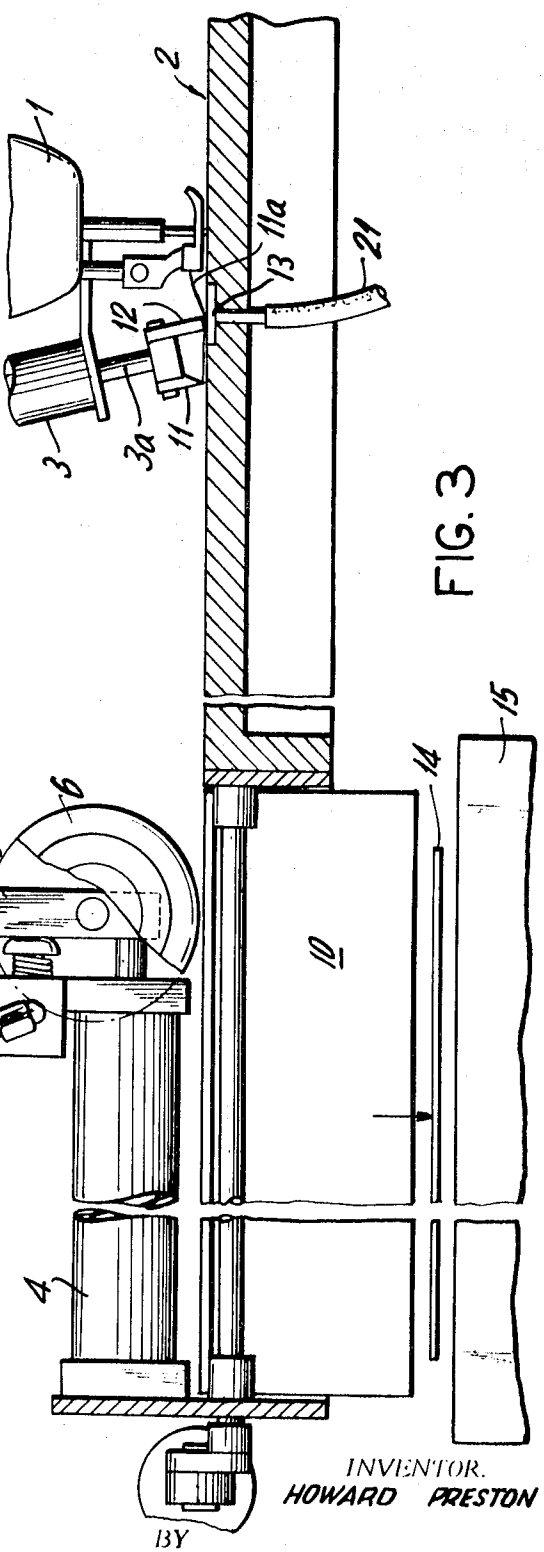


FIG. 3

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GARMENT STACKING APPARATUS

BACKGROUND OF THE INVENTION

This disclosure relates to a work-stacking mechanism for use with sewing machines.

Heretofore, in the textile industry the operator had to remove and stack the workpiece manually after it was completed which caused the entire operation to be slow and hence more expensive. Similarly, previous attempts at automating this portion of the garment sewing process have resulted in rather large, cumbersome and expensive devices. Another problem inherent in prior art automatic devices is that when the thread was severed from the garment, it had a tendency to slip back up into the sewing machine.

SUMMARY OF THE INVENTION

This invention provides a novel means for automatically taking a garment and automatically depositing the same on a stack. A reciprocating means is provided which freely moves onto the garment on the forward stroke and which pulls the garment back with it on the rearward stroke. When the garment is pulled back, means are then activated which allow the garment to be stacked in a predetermined place. Thus, the operation is accomplished with minimum attention on the part of the operator and with a minimum of cumbersome and expensive equipment. The present invention performs the necessary operations on a repeated basis with a high degree of reliability. It operates on a completely automatic cycle which allows the operator to continue the sewing operations while the sewn garments are removed from the sewing machine and stacked at a preselected station.

Further means may be provided which allows the thread to be automatically severed from the garment without retracting back into the sewing machine.

Accordingly, it is an object of this invention to provide a simple and reliable mechanism for engaging and moving a sewn garment from one station to another.

It is a further object of this invention to provide a mechanism which will freely pass over the garment when moved in one direction and engage the garment when moved in the other direction.

These and other objects, advantages and features of the invention will become more apparent from the following description taken in conjunction with the accompanying drawings wherein:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of the garment stacking apparatus attached to a sewing machine.

FIG. 2 is a side view of the garment stacking apparatus with the garment moving element in its extended position.

FIG. 3 is a side view of the garment stacking apparatus with the garment moving element in its retracted position.

FIG. 4 is a cross-sectional view of the wheel of the garment moving element when the garment moving element is travelling toward the workpiece.

FIG. 5 is a cross-sectional view of the wheel of garment moving element when the garment moving element is transporting the workpiece away from the sewing machine to the stacking station.

DESCRIPTION OF PREFERRED EMBODIMENT

With reference to FIG. 1, the sewing machine 1 is a conventional type attached to table 2. Also attached to table 2 is a frame 18 which has mounted thereon a pair of doors 10 which are hinged at their outer longitudinal edge 19 such that they will open by dropping downward. Also attached to frame 18 above doors 10 is a cylinder 4 with an extending piston 5. At the sewing machine end of the piston 5 is attached a block 8 into which an axle 7 is rigidly secured. Disposed on each end of axle 7 is a wheel 6. Attached to the end of the cylinder 4 is a plunger valve 9. Disposed at various other locations are valves

and cylinders which will be described below. It should also be noted that the air power here described could be replaced by electricity or other convenient power.

Referring now to FIG. 2 in operation, a garment is placed in the sewing machine in the direction of arrow 20. As it is sewn, it passes over sensing element 13. The sensing element 13 is preferably in the form of a supply of air supplied by tube 21, although it should be recognized that other sensing devices such as photoelectric cells may be used. As the garment clears aperture 13, the air exerts a pressure on tube 13*a*. The pressure on tube 13*a* causes a valve (not shown) to operate. This valve, in turn, supplies air simultaneously to cylinder 3 and to valve 22. The air supplied to cylinder 3 causes a piston 3*a* in cylinder 3 to move downward. Attached to the end of piston 3*a* is a knife member 11 and a holding member 12 which is preferably made of felt. The knife member 11 severs the thread 11*a* from the garment while the holding member 12 exerts pressure on the thread 11*a* which holds the severed thread in place preventing it from slipping back up into the sewing machine as shown in FIG. 3. Once the thread has been cut, it is no longer under tension and no longer has to be held and hence piston 3*a* retracts ready for the next cycle.

The sensor also causes air to be supplied to valve 22 which causes the piston 5 in cylinder 4 to move toward the sewing machine. As it does, wheels 6 rotate in a clockwise direction and thus roll toward the garment. As shown in FIG. 4, the wheels 6 are mounted on a ratchet 17. When the wheels are moving in a clockwise direction, the teeth of the ratchet pass over stop 16 permitting free rotation of the wheel. The air in cylinder 4 continues to push the piston 5 and the wheels 6 toward the garment causing the wheels to pass over the garment. The piston 5 is at such a height and the wheels 6 are of such diameter that when moving in the forward direction, the wheels 6 are in contact with the garment but such that the wheels 6 roll freely onto the garment. When the piston 5 reaches its fully extended position, it is such that the wheels 6 engage the garment. At this point, valve 23 is actuated such that it causes the piston 5 in cylinder 4 to move in a direction away from the sewing machine. Accordingly, piston 5 and wheels 6 begin to move away from the sewing machine. As shown in FIG. 5, when the wheels 6 start to turn in the counterclockwise direction, the teeth of the ratchet 17 abut against stop 16 such that the wheels 6 cannot turn. Since the wheels 6 are engaging the garment and cannot rotate, as the piston 5 retracts into cylinder 4, the garment is pulled along by the immobile wheels 6. It should be recognized that the desired motion of the wheels can be regulated by means other than the ratchet and abutment described.

The piston 5 continues to retract pulling the garment along with it until block 8 hits plunger valve 9, as shown in FIG. 3. At the point where block 8 hits plunger valve 9, the garment has been pulled away from the sewing machine by wheels 6 until it is resting on doors 10. Block 8, activates plunger valve 9 which sends air to double acting cylinder 25. Cylinder 25 causes pistons 23 to move linkages 24 which in turn cause doors 10 to open downward allowing the garment 14, resting thereon, to fall through and be deposited in a stacking tray 15 or other convenient receptacle. Other convenient receiving apparatus such as a chute may be utilized in place of the doors described. When the next garment clears the sensing element 13, the cycle begins to repeat which causes abutment 8 to move away from plunger valve 9 which cuts off the air from cylinder 22 causing the pistons 23 to retract thereby closing doors 10 so that they are ready to receive the next garment.

It will be appreciated that the above constitutes the preferred embodiment of the present invention and that changes could be utilized without subtracting from the spirit of the invention.

What is claimed is:

1. In combination with a sewing machine, means for transferring a garment from the sewing machine to a preselected station which comprises:

a. a support base;

b. means adjacent said support base for receiving the garment;

c. movable means above said receiving means, said movable means comprising a reciprocating member and one or more rolling members attached to the end thereof, said rolling member being freely rotatable when moved in a direction toward said support base and being nonrotatable when moved in a direction toward said receiving means such that said rolling member moves freely onto said support base when travelling in a direction toward said support base and drags a garment from said support base onto said receiving means when travelling in a direction toward said receiving means.

2. The combination of claim 8 wherein said rolling member rests on said support base when said reciprocating member is fully extended and rests on said receiving means when said reciprocating member is retracted.

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