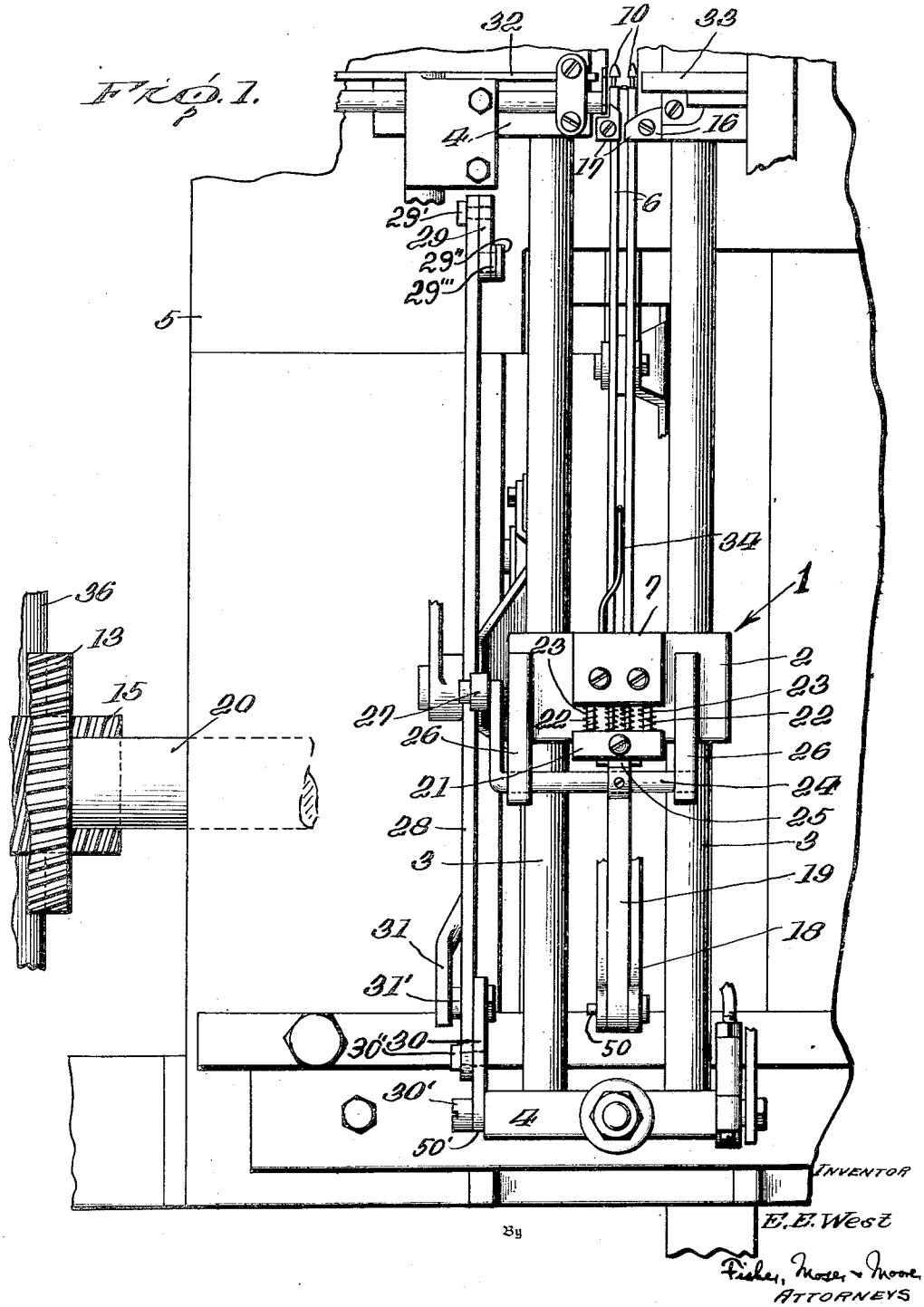
Jan. 23, 1945. E. E. WEST 2,367,986

STRINGING NEEDLE

Original Filed Jan. 10, 1939 3 Sheets-Sheet 1

FIG. 1.



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FIG. 2.

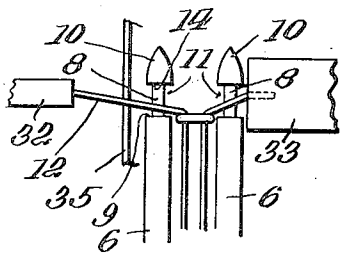


FIG. 3.

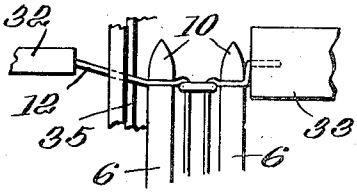


FIG. 4.

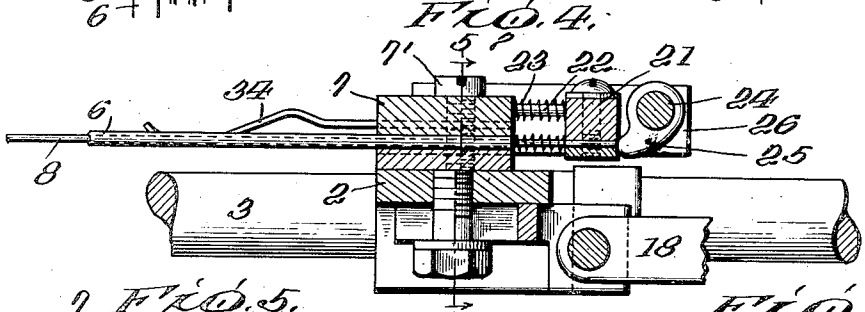


FIG. 5.

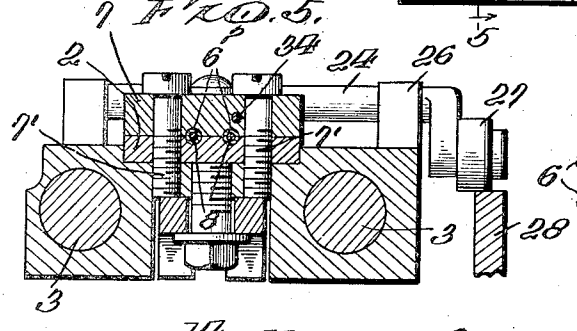
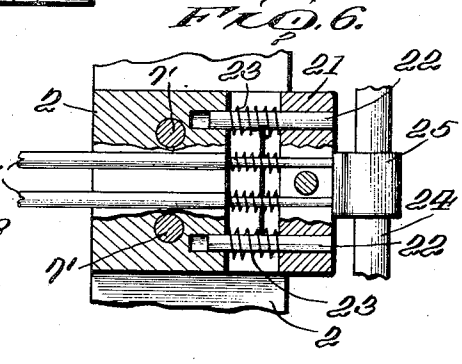


FIG. 6.



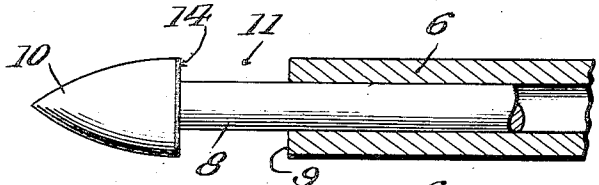


FIG. 7.

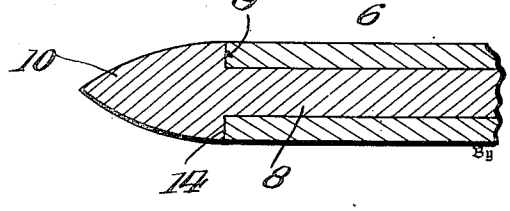


FIG. 8.

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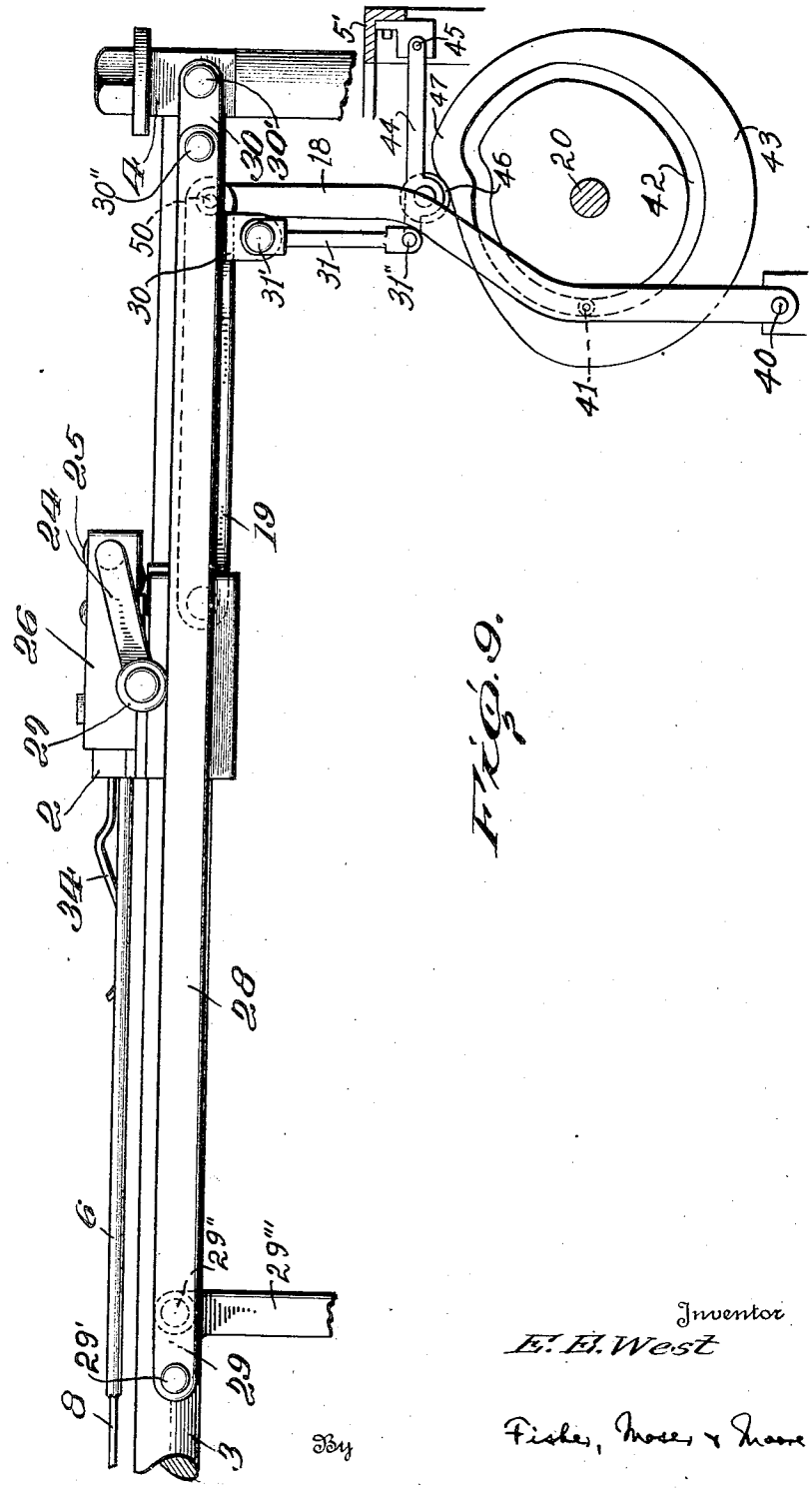


Fig. 9.

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Patented Jan. 23, 1945 2,367,986

UNITED STATES PATENT OFFICE

2,367,986

STRINGING NEEDLES

Edward E. West, Richmond, Va.

Original application January 10, 1939, Serial No. 250,223, now Patent No. 2,274,622, dated February 24, 1942. Divided and this application November 13, 1941, Serial No. 418,998

25 Claims. (Cl. 112—221)

This invention relates to stringing needles for stringing hemmed bags, which is a division of my pending application Serial No. 250,223, filed January 10, 1939, now Patent No. 2,274,622 February 24, 1942.

The principal object of the present invention is to provide stringing needles having means associated therewith for clamping strings therein to assure of the hemmed bags being accurately strung.

Another object is the provision of stringing needles having movable means incorporated therein for securely gripping strings whereby the same are uniformly delivered through the hems of the bags.

A further object is to provide a pair of stringing needles having slidable cooperating parts for gripping the ends of the strings to assure of the strings being uniformly carried through the hems of the bags.

These and other objects and advantages will be apparent as the specification is considered with the accompanying drawings wherein:

Figure 1 is a plan view of the bag stringing needles and the operating structure therefor;

Figure 2 is a diagrammatic view of the needles, in open string receiving position, preparatory to being actuated to closed gripping position;

Figure 3 is a diagrammatic view of the needles in closed string gripping position, preparatory to being moved through the hems of a bag;

Figure 4 is a section through the needle supporting saddle mounted on the guide track, showing the cam means for opening and closing the needles;

Figure 5 is a section through the needle saddle, along the line 5—5 of Figure 4;

Figure 6 is a section through the needle saddle, showing the cam means for opening and closing the needles;

Figure 7 is a section through one of the needle sleeves, with the needle in open position;

Figure 8 is a section through one of the needle sleeves, showing the needle in closed string gripping position; and

Figure 9 is a side elevation of the structure for operating the needles.

Referring more particularly to the drawings, wherein similar reference characters designate like parts throughout the several views, numeral 1 denotes a stringing needle carriage of a bag stringing machine, not shown, for delivering draw strings through the hems of tobacco bags and the like, described and illustrated in my pending application, Serial No. 250,223, now Patent No. 2,274,622, February 24, 1942, filed January 10, 1939. The stringing needle carriage 1 comprises a relatively flat, substantially rectangular, needle saddle or plate 2 slidably sleeved on two, spaced, horizontally positioned, guide tracks 3, fixedly connected at their outer ends in blocks 4 supported by the top frame 5 of the stringing machine.

The inner ends of two longitudinally extending, substantially parallel, hollow needle sleeves 6 are rigidly supported in a block or plate 7 suitably secured by screws 7' to the top of the needle saddle 2, and two pointed needle members 8 are slidably arranged within the sleeves 6 and project through the forward ends 9 thereof, for reciprocating movement relative thereto. Reciprocation of the needle members 8, through the sleeves 6, as presently described, moves the needle points 10 away from the forward ends 9 of the sleeves 6 to provide gaps or eyes 11, for the insertion of strings 12 therein. When the needle members 8 are moved to closed or string gripping position, the strings 12 are clamped or gripped between the relatively flat rear ends 14, of the needle points 10, and the flat forward ends 9, of the sleeves 6. The needle sleeve 6 and needle points 10 slidably extend through suitable guide openings 17, in a plate 16 mounted on one of the blocks 4, and are thus guided, during their forward and return strokes, through the hems of a bag, not shown, supported on a pair of vertically disposed bag holding arms, of a rotating turret head, also not shown. The needle saddle 2 is reciprocated, forwardly and rearwardly on the guide tracks 3, to move the needle members 8 through the hems of a bag, by any suitable means, such as a substantially vertically disposed lever 18 pivotally connected, at its upper end, as at 50, to an arm 19, in turn pivoted to the rear end of the saddle 2. Lever 18 fulcrumed, at its lower end, to the machine frame as at 40, carries a roller 41, which travels in a cam groove 42, in the side face of a large cam 43, carried by a main drive shaft 20. A gear 13, mounted on the main drive shaft 20, meshes with a gear 15 on a drive shaft 36 which is driven, through main drive shaft 20, by a suitable source of power, not shown, for operating the bag-feeding mechanism, not shown, in this case. Upon rotation of the cam, through the shafts 20, the lever 18 and arm 19 reciprocate the needle saddle back and forth on the guide tracks 3 and move the threaded needle members through the bag hems.

The rear ends of the needle members 8 are fixed within a small block 21, mounted on the needle saddle 2 and connected by a pair of spring tensioned pins 22 to the saddle block 7, for slight sliding movement relative thereto. The block 21 is forwardly actuated, against the tension of springs 23, mounted on the pins 22, by any suitable means, such as a small cam 25 carried by one end of a crank 24, supported in a pair of journal blocks 26, secured to the rear end of needle saddle 2. The other end of the crank 24 carries a roller 27 which rides over and is periodically actuated by a

horizontally disposed lifting arm 28, extending along the side of one of the saddle guide tracks 3. The arm 28 is pivotally connected, at one end, as at 29', to one end of a link 29, the other end of the link being pivoted by means of a pivot pin 29'', to the upper end of a bracket 29''' in turn suitable fixed, at its lower end, to the top frame 5 of the machine. The other end of the arm 28 is pivotally connected to and intermediate the ends of the horizontally disposed arm of a bell crank 30, by means of a pivot pin 30'', the free end 50' of this horizontally disposed arm of the bell crank being pivoted as at 30', to the side of the guide track block 4. The vertically disposed arm of the bell crank 30 is pivotally connected, at its lower end, as at 31', to the upper end of a pitman 31. The pitman 31 is pivoted, at its lower end, as at 31'' to the free end of a horizontally disposed arm 44, fulcrumed at 45 to the side of the machine frame 5'. A roller 46, carried by arm 44, rests on the periphery of the previously mentioned cam 43, for opening and closing the needles. Thus once in each rotation of the cam the roller 46 rides over a raised portion or hum 47, on the cam 43, whereupon movement of the associated linkage, swings or lifts the arm 28 upwardly thereby raising the rollered crank arm 24 and reciprocating the needle block 21, relative to the needle saddle 2, in an obvious manner. It will be understood that both ends of the lifting arm 28 are raised and lowered in unison and consequently that the arm 28 always remains substantially horizontal.

It is to be understood that the actuating mechanism, just described, for reciprocating the needle saddle 2 on the guide tracks 3 and moving the needle members 8, relative to the needle sleeves 6, and opening and closing the same, has been herein shown and described merely for the purpose of illustration, and that the same is more particularly described and illustrated in my pending application, Serial No. 250,223, filed January 10, 1939.

When the end of a string 12 is fed across the needles by a string tube 32, the string is gripped by a gripper 33 at the needle threading station, and, after the string has been gripped thereby and the looped string pulled by a string hook 34 to the length necessary for service as a draw string, a cutter 35 severs the string and permits the needles to advance and carry the severed string section through the bag hems. This mechanism, illustrated diagrammatically in Figures 2 and 3, is shown and described in my pending application, hereinbefore referred to, and does not comprise a part of the present invention. While the string is being gripped by the gripper 33 and pulled to the necessary length by the hook 34, the needle saddle 2 and needles are being moved rearwardly along the guide tracks 3. With the string 12 extending across the needle, the saddle block 21 is moved, by the cam 25, forwardly and the needle members 8 are caused to slide forwardly through the needle sleeves 6 so that the needle points 10 are moved away from, or out of engagement with, the forward ends 9 of the sleeves. In this open position of the needles, the gaps or eyes 11, between the respective ends of the needle points 10 and sleeves 6, receive the extended end of the thread, and the cam 25 is thereupon moved out of engagement with the saddle block 21. The tension of the springs 23 moves the block 21 rearwardly and retracts the needle members 8 in the sleeves 6 so that the flat rear ends 14 of the needle points 10 are moved into abutting engagement with the flattened forward ends 9 of the sleeves and the string 12 is securely gripped or clamped therebetween. The needle saddle is thereupon moved forwardly, along the guide tracks 3, to deliver the needle sleeves and needles, in closed string gripping position, through the hems of a bag. As the string 12 is gripped by the needles, during the feeding of the same through the bag hems, the string cannot slip through or be withdrawn from the needles and the bag hems are assured of being accurately and uniformly strung.

It is to be understood that the provision of needles having positive means for gripping or clamping string therein is an advancement in the art. While I have shown and described a form of my invention, it is to be further understood that numerous changes and improvements may be made without departing from the scope and spirit of the appended claims.

Having thus described my invention, what I claim is:

1. A bag stringing mechanism of the character described having a needle supporting plate movably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said plate, each of said needles comprising a tube and a cooperating pointed shank sleeved within said tube, said tube and shank having cooperating substantially flat faces thereon forming therebetween a string receiving opening, movable means on said plate engageable with the ends of said needle shanks and having means engageable with said movable means for moving said means and said shanks relative to said tubes to open said openings and receive the ends of the strings in said needles and means for moving said gripping faces in opposing directions to grip the strings.

2. A bag stringing mechanism of the character described having a needle supporting plate movably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said plate, each of said needles comprising a tube and a cooperating shank sleeved within said tube, said tube and shank having cooperating faces thereon forming therebetween a transverse string receiving opening, a spring pressed block on said plate engageable with the ends of said needle shanks and having cam means engageable therewith for moving said block and said shanks relative to said tubes to open said openings and receive the ends of the strings in said needles, said spring functioning to move said needle shanks and said gripping faces in opposing directions to grip the strings.

3. A bag stringing mechanism of the character described having a needle supporting plate slidably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said plate, each of said needles comprising a tube and a cooperating pointed shank sleeved within said tube, said tube and shank having cooperating substantially flat faces thereon forming therebetween a transverse string receiving opening, a block having the ends of said needle shanks connected thereto, said block being slidably mounted on and connected to said plate, a cam member adjacent said block and engageable therewith for moving said block and needle shanks relative to said tubes to open said openings and grip the ends of the strings in said needles, and means for moving said block, needle shanks and said gripping faces in opposing directions to grip the strings.

4. A bag stringing mechanism of the character described having a needle supporting plate slidably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said plate, each of said needles comprising a tube and a cooperating shank sleeved within said tube, said tube and shank having cooperating faces thereon forming therebetween a transverse string receiving opening, a block having the ends of said needle shanks connected thereto, said block being slidably mounted on and connected to said plate, means rotatably mounted adjacent said block having a cam member thereon engageable with said block, and means engageable with said means for rotating the same and said cam member and moving said block and needle shanks relative to said tubes to open said openings and receive the ends of the strings in said needles, and means for moving said block, needle shanks and said gripping faces in opposing directions to grip the strings.

5. A bag stringing mechanism of the character described having a needle supporting plate slidably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said plate, each of said needles comprising a tube and a cooperating shank sleeved within said tube, said tube and shank having cooperating faces thereon forming therebetween a transverse string receiving opening, a block having the ends of said needle shanks connected thereto, said block being slidably mounted on and connected to said plate, a crank rotatably mounted adjacent said block having a cam member thereon engaegable with said block, and a substantially horizontally disposed member pivotally mounted adjacent said guide tracks and engageable with said crank for rotating the latter and said cam member and moving said block and needle shanks relative to said tubes to open said openings and receive the ends of the strings in said needles, and means for moving said block, needle shanks and said gripping faces in opposing directions to grip the strings.

6. A bag stringing mechanism of the character described having a needle supporting plate slidably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said plate, each of said needles comprising a tube and a cooperating shank sleeved within said tube, said tube and shank having cooperating faces thereon forming therebetween a transverse string receiving opening, a block having the ends of said needle shanks connected thereto, said block being slidably mounted on and connected to said plate, a crank rotatably mounted adjacent said block and having a roller on one end thereof, a cam member on said crank engageable with said block, a substantially horizontally disposed arm pivotally mounted parallel to said guide tracks and engageable with said roller, and means for substantially vertically moving said arm and rotating said crank and cam whereby said block and needle shanks are moved relative to said tubes to open said openings and receive the ends of the strings in said needles, and means for moving said block, needle shanks and said gripping faces in opposing directions to grip the strings.

7. A bag stringing mechanism of the character described comprising needle mechanism for inserting a string into the hem of a bag and comprising a string carrying needle consisting of a pair of relatively longitudinally movable members having a string receiving gap for gripping the string therein, automatically operative means for shifting said members into and out of the hem and in timed relation therewith relatively shifting said members to grip the string prior to the passage of the needle into the hem of the bag and for releasing said string after the passage of the needle into the hem.

8. The subject matter of claim 7 in which one of said pair of members is slidable within the other.

9. The subject matter of claim 7 in which one of said pair of members comprises a pointed member, and in which one member is slidable within the other.

10. The subject matter of claim 7 in which one of said pair of members comprises a sleeve and the other a pointed member slidably engaged with said sleeve.

11. The subject matter of claim 7 in which one of said pair of members comprises a pointed member, and in which one member is slidable within the other, said members having opposed cooperating faces for clamping the string.

12. The subject matter of claim 7 in which one of said pair of members comprises a sleeve and the other a pointed member slidable within said sleeve, said sleeve and other member having opposed cooperating faces for clamping the string.

13. A bag stringing mechanism of the character described comprising needle mechanism for inserting a string into the hems of a bag and comprising a pair of string carrying needles, each comprising a pair of relatively longitudinally movable members having a string receiving gap for gripping the string therein and automatically operative means for shifting said members into an out of the hem and in timed relation therewith for relatively shifting said members to grip the string prior to the passage of each needle into the hem of a bag and for releasing said string after the passage of each needle into the hem.

14. The subject matter of claim 13 in which both needles are simultaneously shifted with their gripped strings through the two side hems of the bag.

15. The subject matter of claim 13 in which both needles are simultaneously shifted with their gripped strings through the two side hems of the bag and back through the same hems to carry a pair of strings through each of said hems.

16. In a bag stringing needle mechanism for stringing fabric bags, a pair of stringing needles, each of said needles comprising a tube and a cooperating shank sleeved within said tube, said tube and shank having opposed cooperating gripping faces thereon forming therebetween a transverse string receiving opening, automatic means for moving said shanks relative to said tubes to force said cooperating faces into approximate contact with each other to close said openings and to grip the ends of the strings in said needles, said needles being bodily movable for penetration of the fabric and to carry the gripped ends of the string therethrough and automatic means for moving said gripping faces in opposing directions to release the strings.

17. In a bag stringing mechanism for stringing fabric bags, a pair of stringing needles, each of said needles comprising a tube and a cooperating pointed shank sleeved within said tube, said tube and shank having opposed cooperating gripping faces thereon forming therebetween a transverse string receiving opening, spring means for moving said shanks relative to said tubes to force said cooperating faces into approximate contact

with each other to close said openings and to grip the ends of the strings in said needles, said needles being bodily movable for penetration of the bag fabric and to carry the gripped ends of the string therethrough, and automatic means for moving said gripping faces in opposing directions to release the strings.

18. In a bag stringing mechanism for stringing fabric bags, a needle supporting means slidably mounted on a guide means, a pair of stringing needles mounted in said supporting means, each of said needles comprising a tube and a cooperating shank sleeved within said tube, said tube and shank having opposed cooperating gripping faces thereon forming therebetween a transverse string receiving opening, automatically actuated means associated with said needle supporting means for moving said shanks relative to said tubes to open said openings and receive the ends of the strings in said needles and spring means for moving said gripping faces in opposing directions to force said cooperating faces into approximate engagement with each other to grip the strings regardless of the thickness thereof, said needles being bodily movable for penetration of the bag fabric and to carry the gripped ends of the string therethrough.

19. In a bag stringing needle mechanism for stringing fabric bags, a needle supporting plate slidably mounted on a pair of guide members and operating mechanism therefor, a pair of stringing needles mounted in said supporting plate, each of said needles comprising a tube and a cooperating pointed shank sleeved within said tube, said tube and shank having cooperating gripping faces thereon forming therebetween a transverse string receiving opening, means on said supporting plate for moving said shanks relatively to said tubes to open said openings and receive the ends of the strings in said needles and means for moving said gripping faces in opposing directions to force said cooperating faces into approximate engagement with each other to grip the strings, regardless of the thickness thereof, said needles being bodily movable point first for penetration of the bag fabric and to carry the gripped string therethrough.

20. A bag stringing needle mechanism for stringing fabric bags comprising a needle supporting plate slidably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said supporting plate, each of said needles comprising a tube and a cooperating pointed shank sleeved within said tube, said tube and shank having cooperating gripping faces thereon forming therebetween a transverse string receiving opening, means associated with said supporting plate and operative for moving said shanks relative to said tubes to open said openings and receive the ends of the string in said needles and means for moving said gripping faces in opposing directions to force said cooperating faces into approximate engagement with each other to grip the string, regardless of the thickness thereof, said needles being bodily movable point first for penetration of the bag fabric and to carry the gripped string therethrough.

21. A bag stringing needle mechanism for stringing fabric bags comprising a needle supporting plate slidably mounted on a pair of guide tracks and operating mechanism therefor, a pair of stringing needles mounted in said supporting plate, each of said needles comprising a tube and a cooperating pointed shank sleeved within said tube, said tube and shank having cooperating faces thereon forming therebetween a transverse string receiving opening, means engageable with the ends of said needle shanks and having means associated therewith for moving said shanks relative to said tubes to open said openings and receive the ends of the strings in said needle and means for moving said gripping faces in opposing directions into approximate engagement with each other to grip the strings, regardless of the thickness thereof, said needles being bodily movable point first for penetration of the bag fabric and to carry the gripped string therethrough.

22. A bag stringing needle mechanism for stringing fabric bags comprising a pair of stringing needles, each of said needles comprising a hollow member and a cooperating member having cooperating gripping faces, said members movable longitudinally relative to each other, automatic means for shifting said members relatively to each other in one direction to force said gripping faces into approximate contact with each other to clamp the ends of the string in said needles, regardless of the thickness of the string, and automatic means for shifting said members relatively to each other in the opposite direction to release the string, said needles being initially bodily movable first toward the bag for penetration of the bag fabric and to carry the gripped ends of the string therethrough and finally in a reverse direction after the ends of the string have been released.

23. A bag stringing needle mechanism for stringing fabric bags having a needle, said needle comprising a hollow member and a cooperating member having cooperating gripping faces, said members movable longitudinally relative to each other, automatic means for shifting said members relatively to each other in one direction to force the said gripping faces into approximate engagement with each other to clamp the end of the string in said needle, regardless of the thickness of the string, and automatic means for shifting said members relatively to each other in the opposite direction to release the string, said needle being bodily movable for penetration of the bag fabric and to carry the clamped string end therethrough.

24. A bag stringing needle mechanism of the character described comprising a stringing needle operative to carry a string through a hem, said needle having relatively movable opposed gripping faces for gripping and maintaining a thread, against movement therebetween, and operative to carry it through said hem without slipping.

25. A bag stringing needle mechanism of the character described comprising a pair of stringing needles operative to carry the free ends of a string through a hem, said needles each having relatively movable opposed gripping means for gripping and maintaining the two free ends of the string against movement and operative to carry both ends of the string through the hem without slipping.

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