United States Patent [19]

Moore

[11] **3,850,381**

[45] **Nov. 26, 1974**

[54] **DEVICE FOR ROLLING SECTIONS OF CARPET**

[76] Inventor: **Arthur Ronald Moore,** 3512 Hilly Ln., Elkhart, Ind. 46514

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[52] **U.S. Cl.**..... **242/66,** 242/67.1 R, 242/DIG. 3

[51] **Int. Cl.**..... **B65h 17/12**

[58] **Field of Search**..... 242/66, DIG. 3, 67.1 R, 242/55, 55.1; 72/146

[56] **References Cited**

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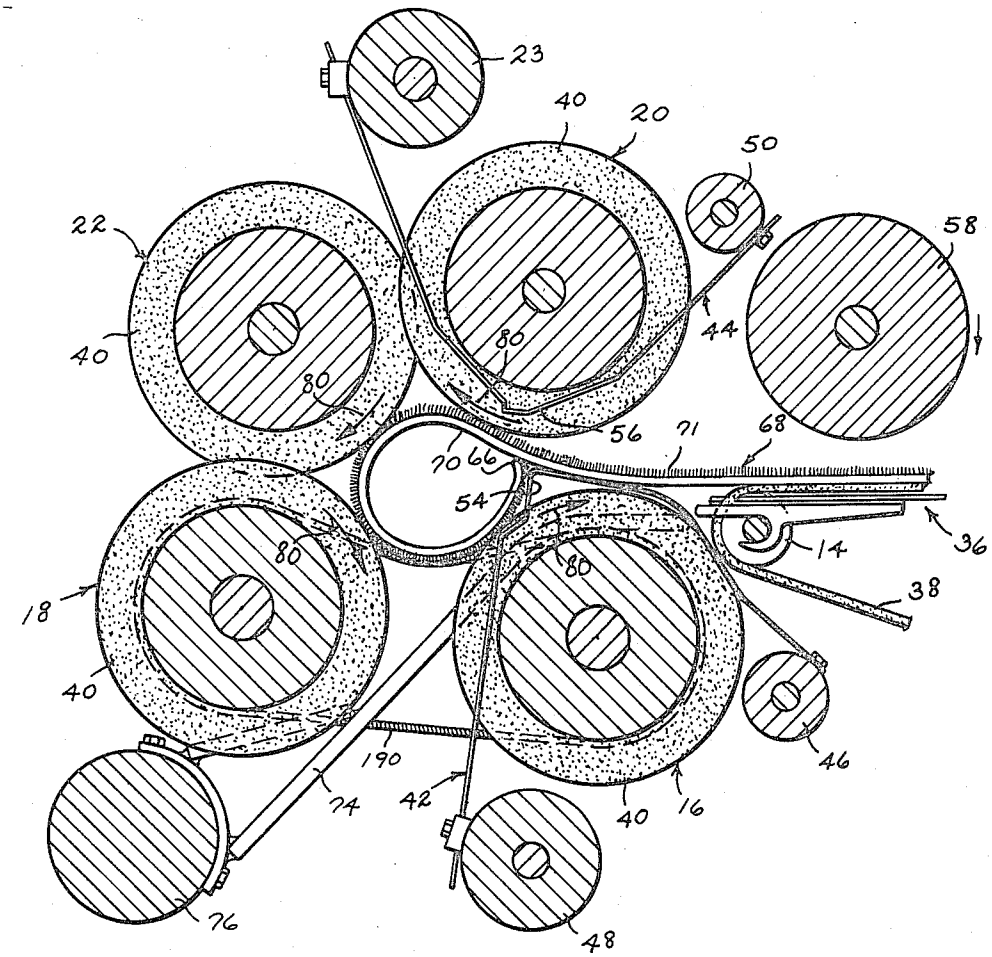
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Primary Examiner—John W. Huckert
Assistant Examiner—John M. Jillions
Attorney, Agent, or Firm—Oltsch & Knoblock

[57] **ABSTRACT**

A device for rolling a section of carpet having a face for walking upon and a back in which such section depending upon the desire of the user of the device may be rolled with either its face or back out.

10 Claims, 17 Drawing Figures



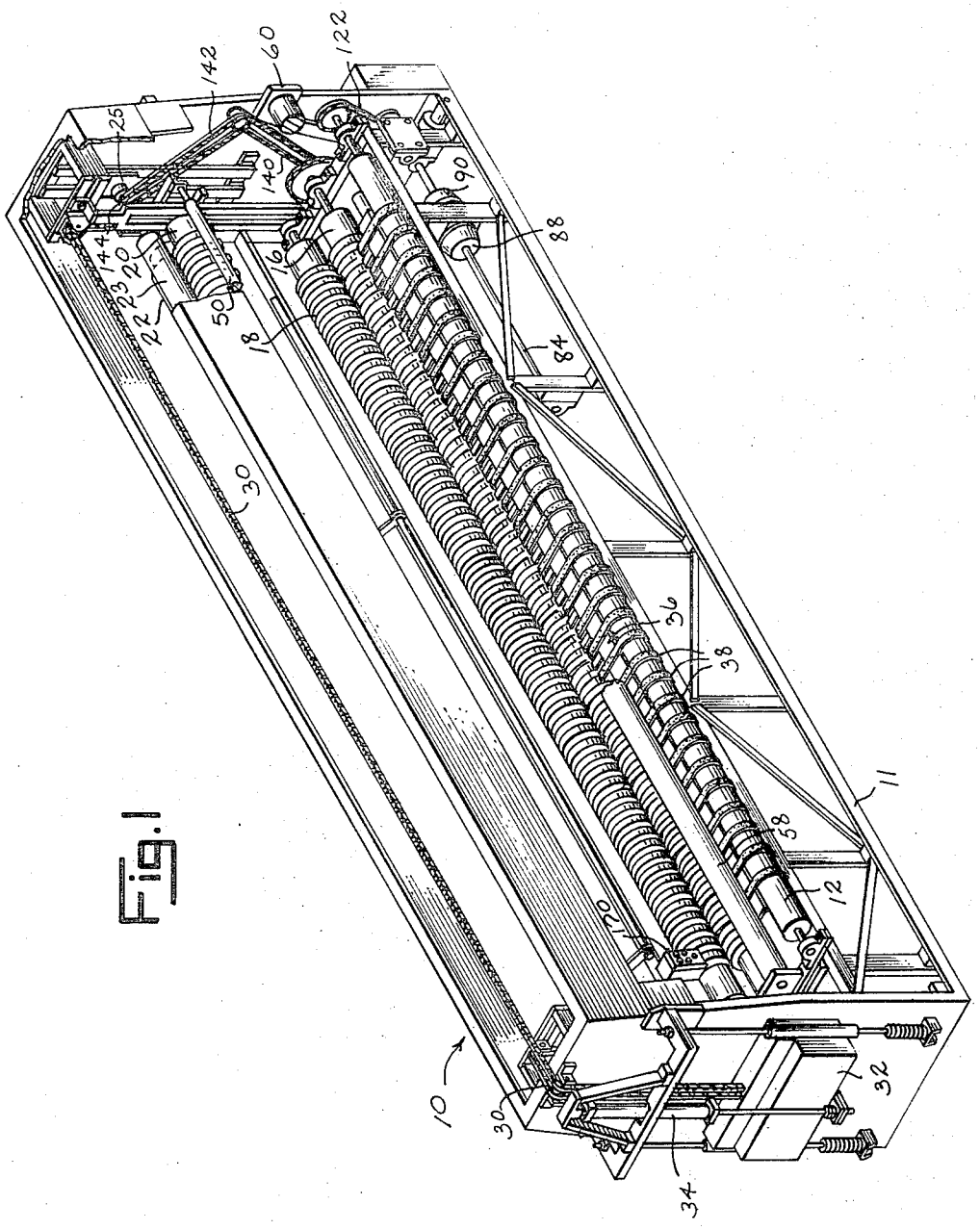

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Fig. 1

Fig. 2

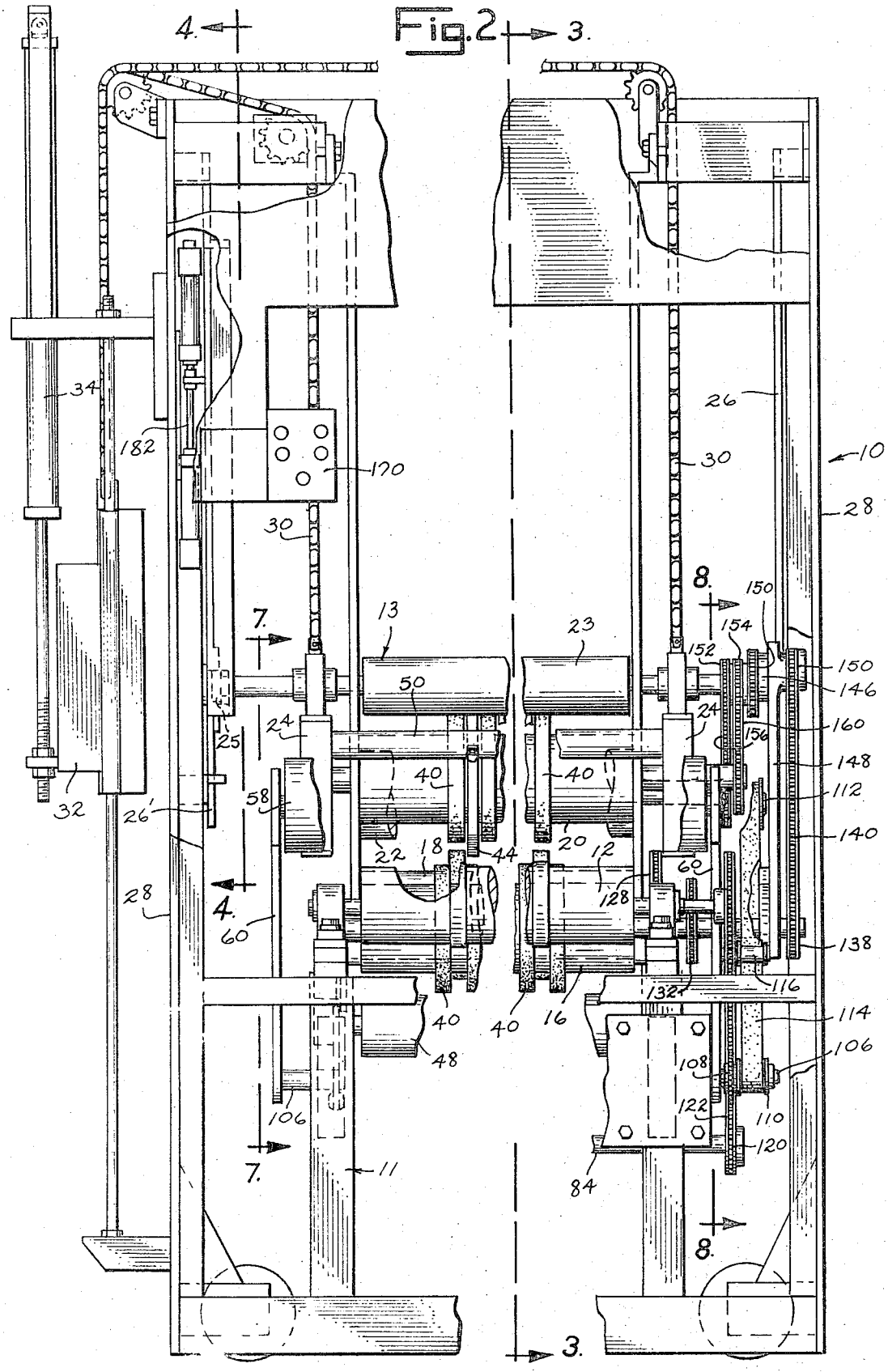

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Fig. 3

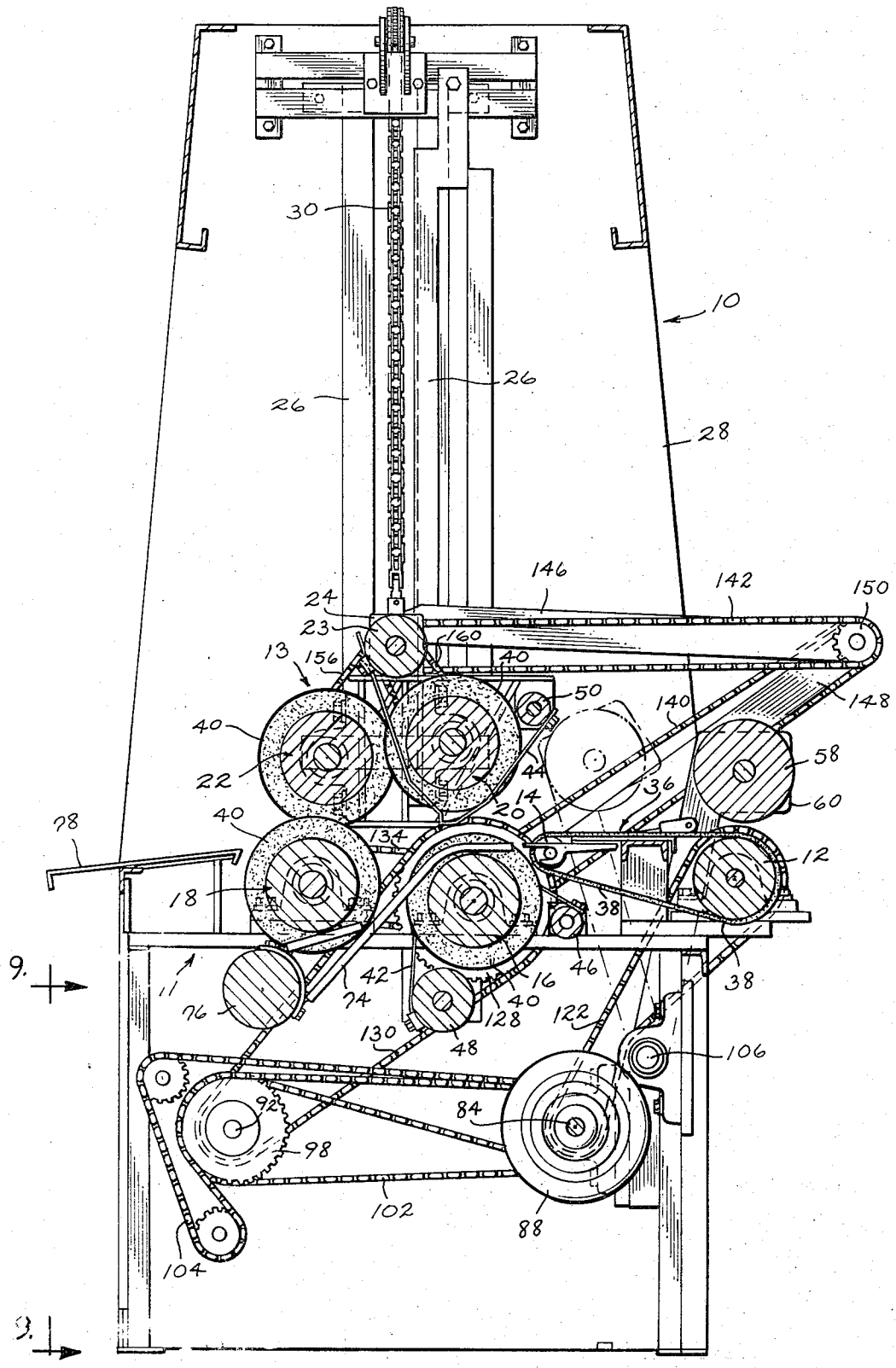

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Fig. 4

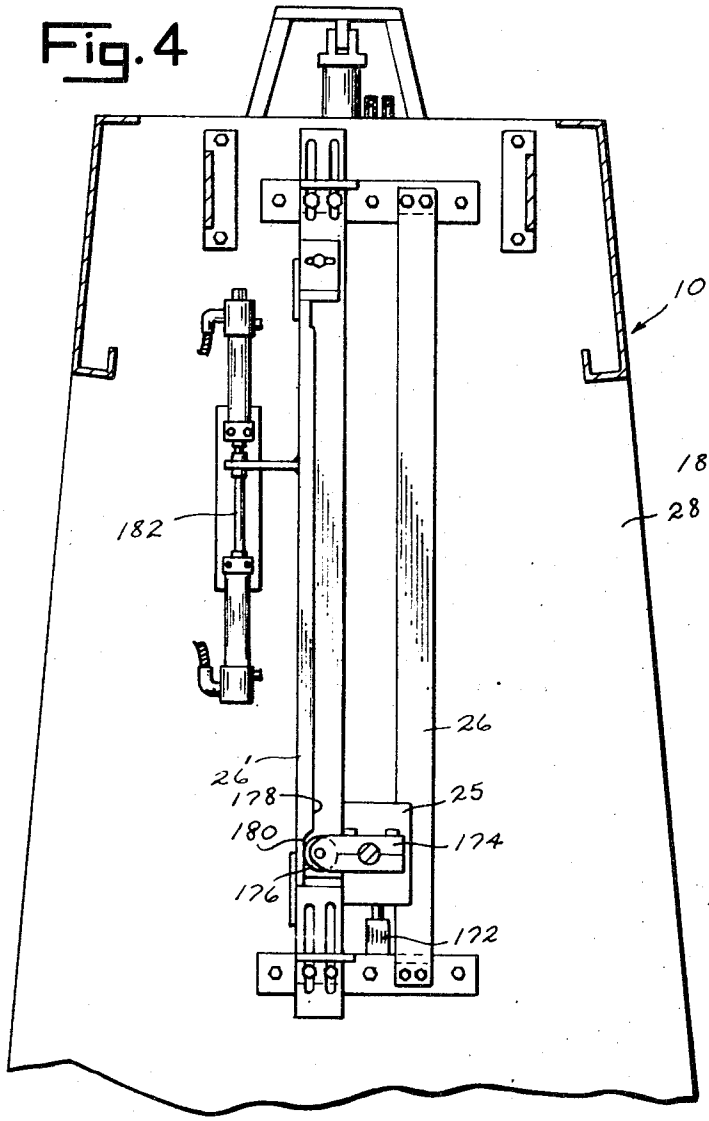
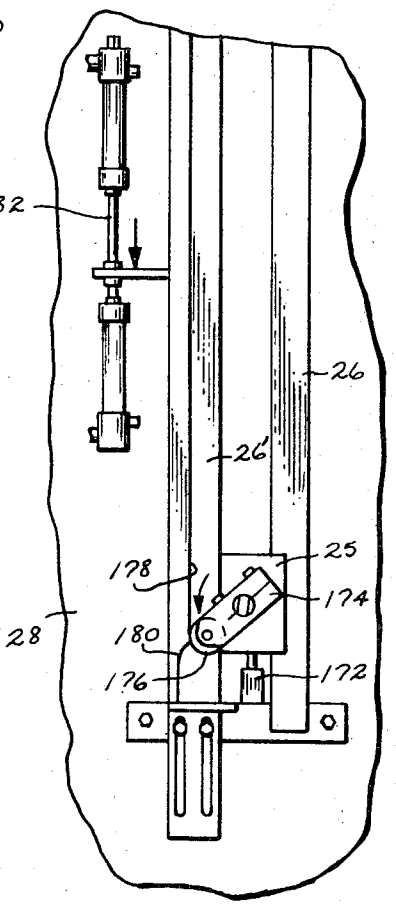


Fig. 6



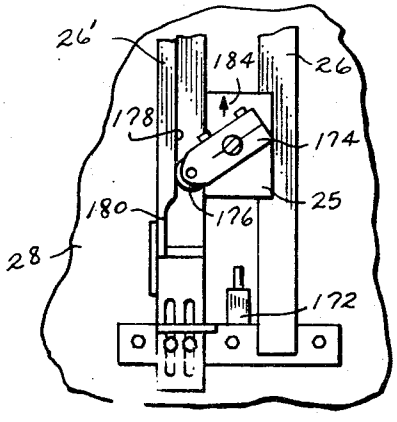


Fig. 5

Fig. 7

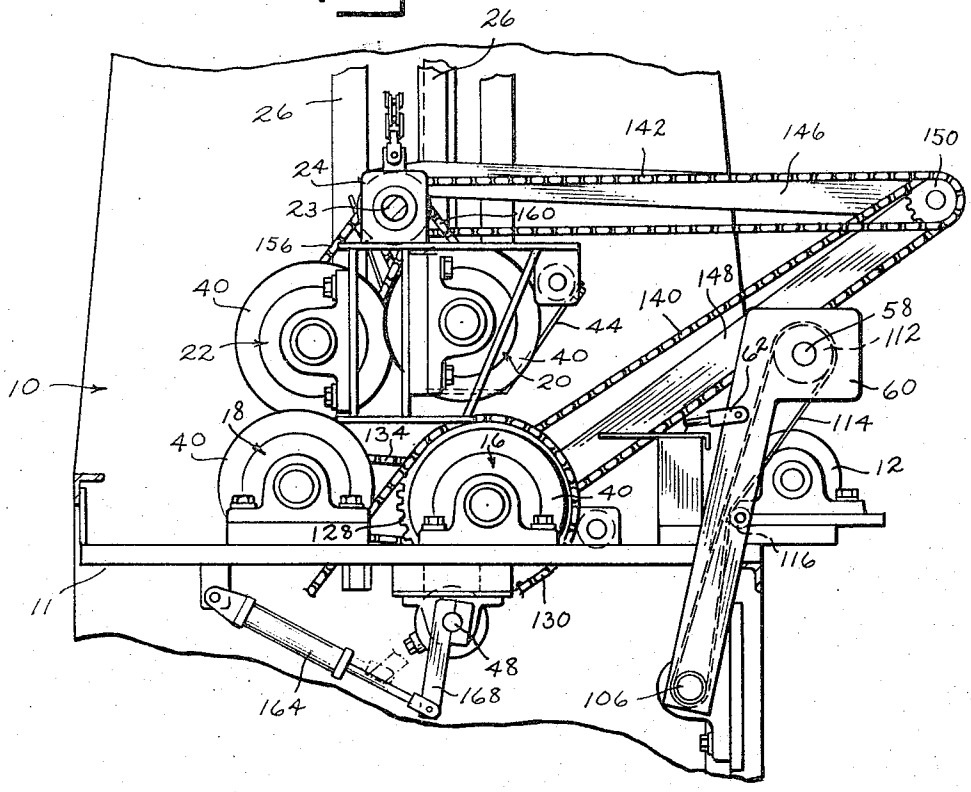

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Fig. 8

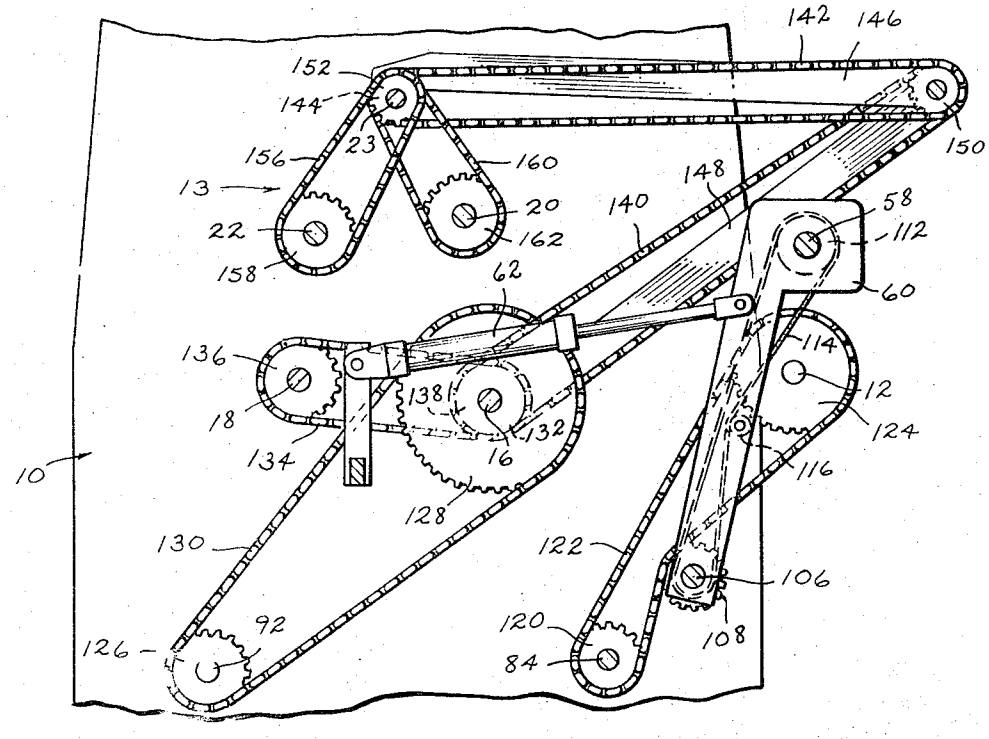

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Fig. 12

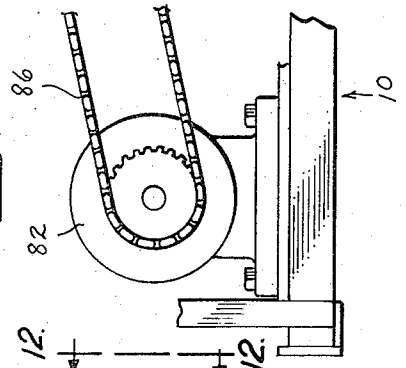


Fig. 9

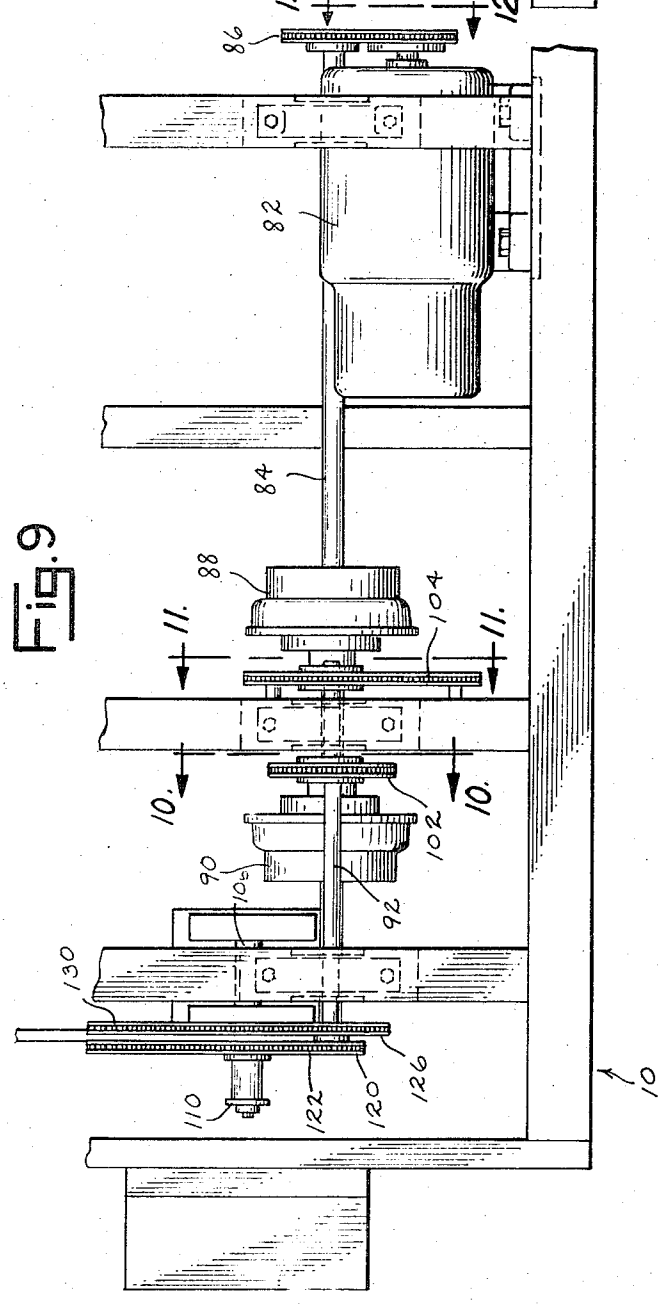


Fig. 11

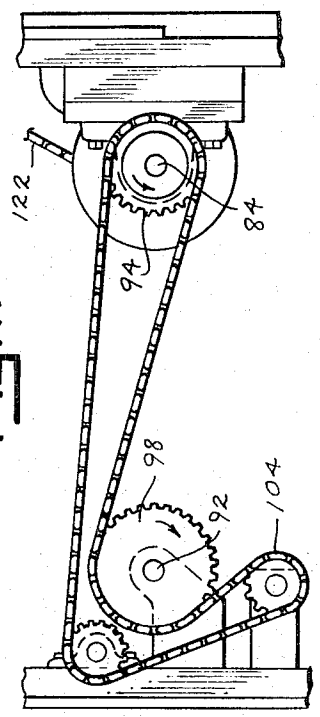


Fig. 10

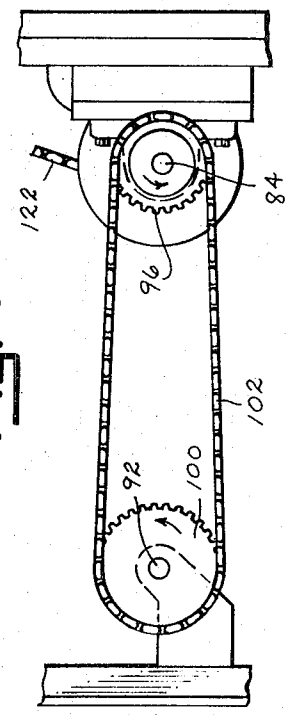


Fig. 13

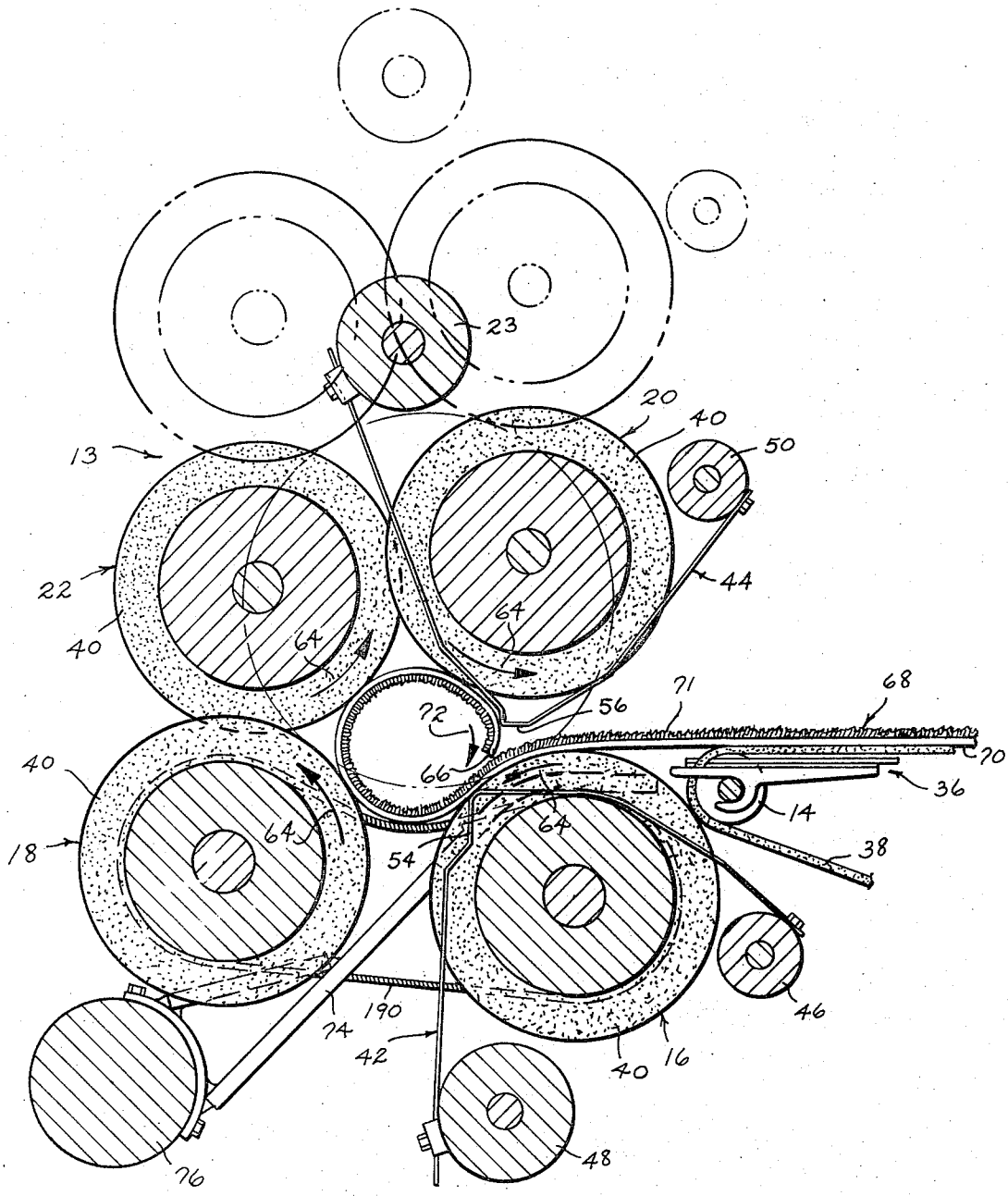

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Fig. 14

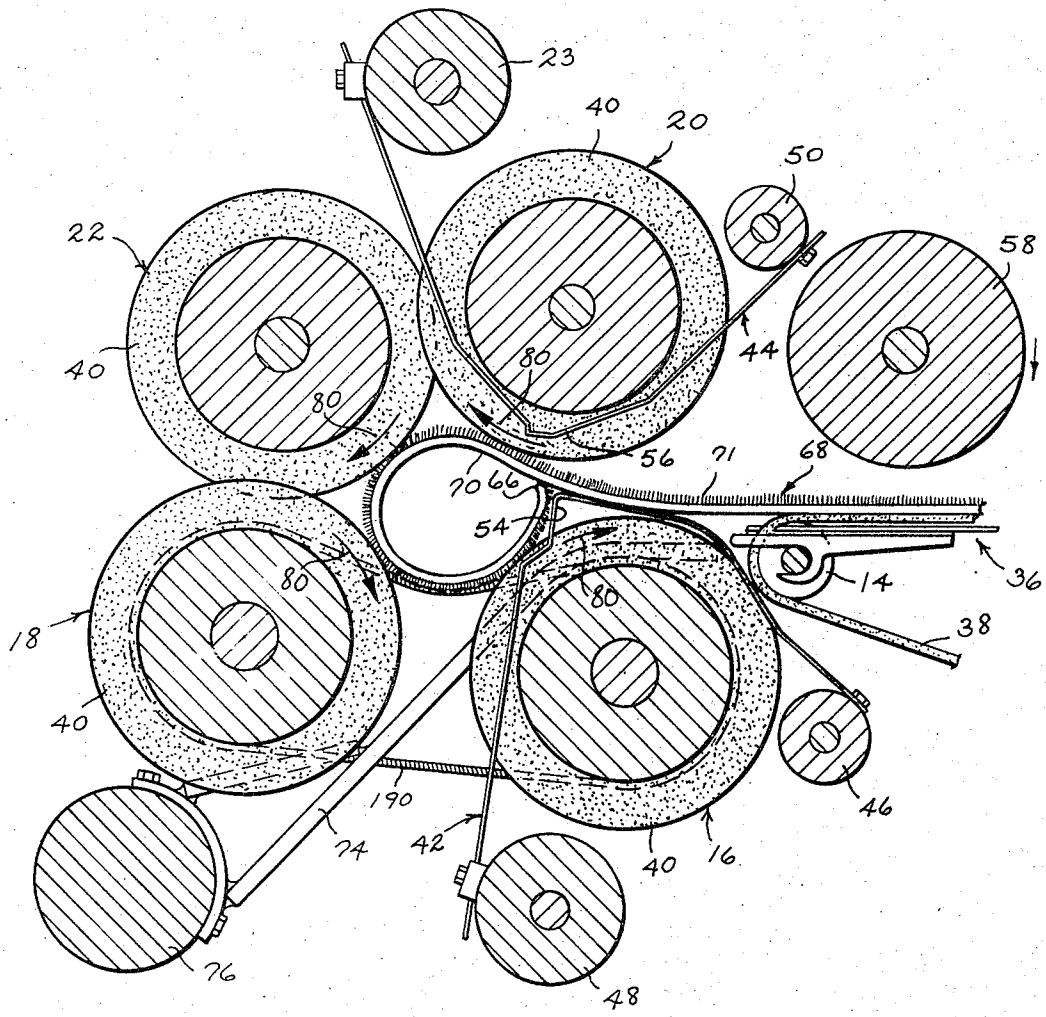

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Fig. 15

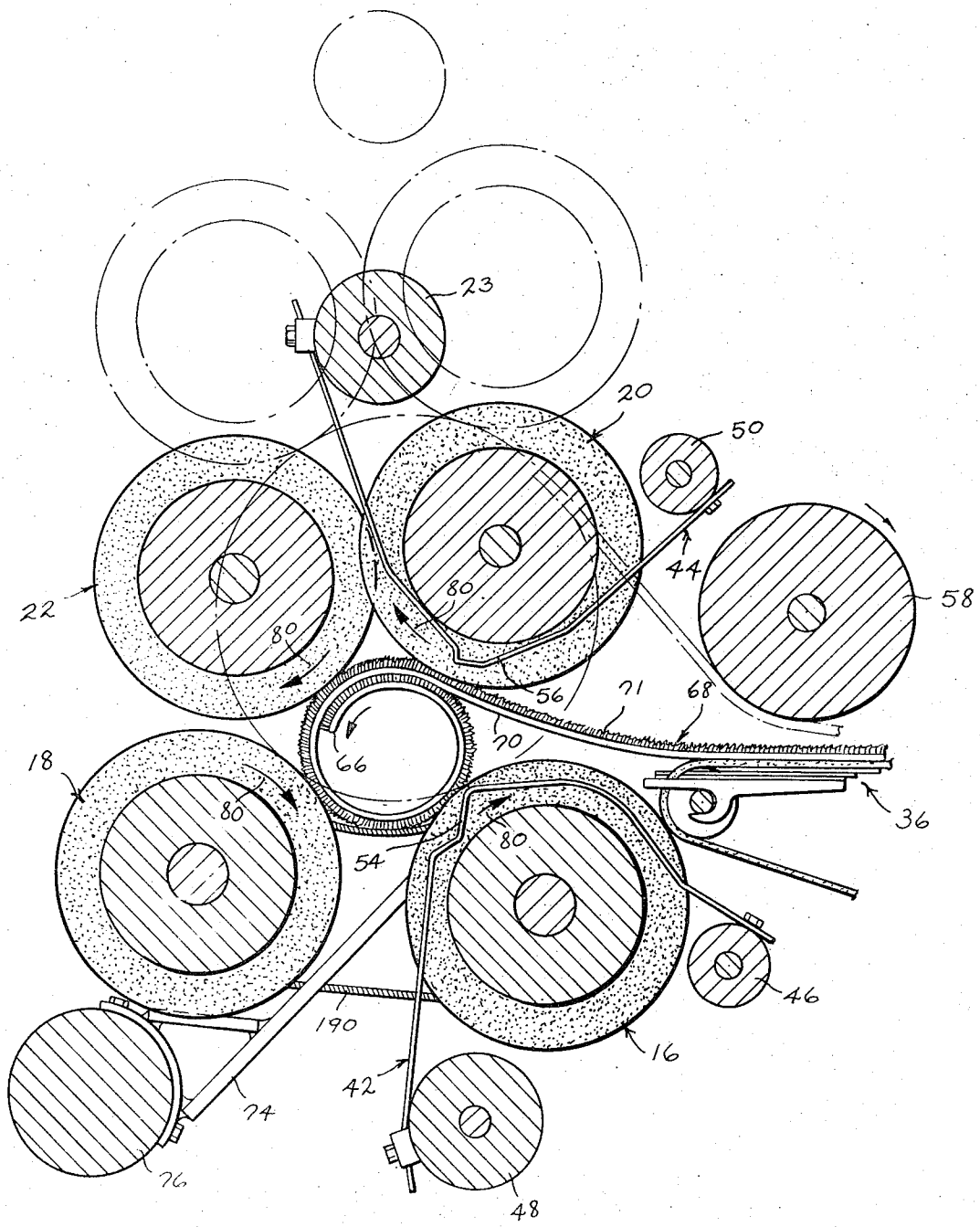
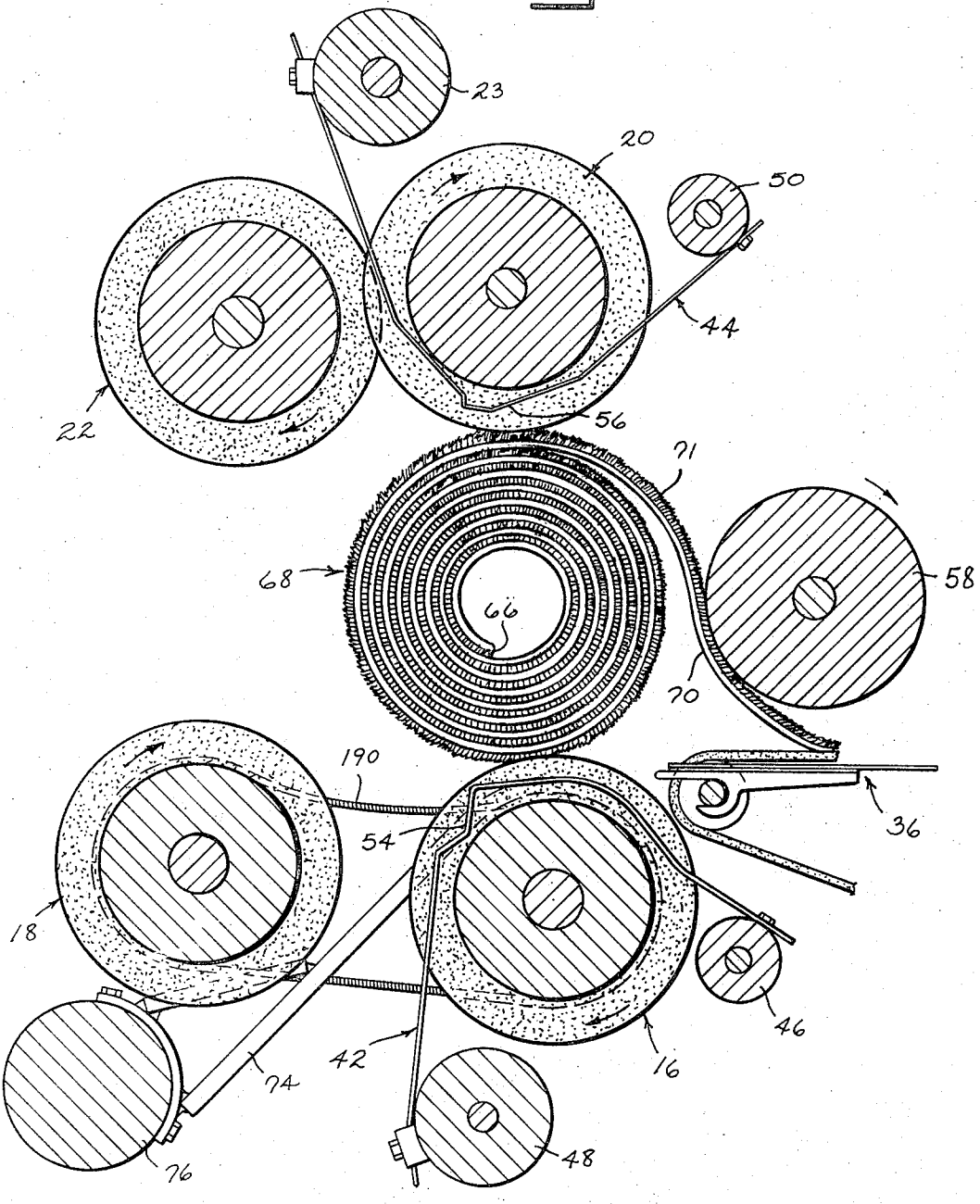

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Fig. 16



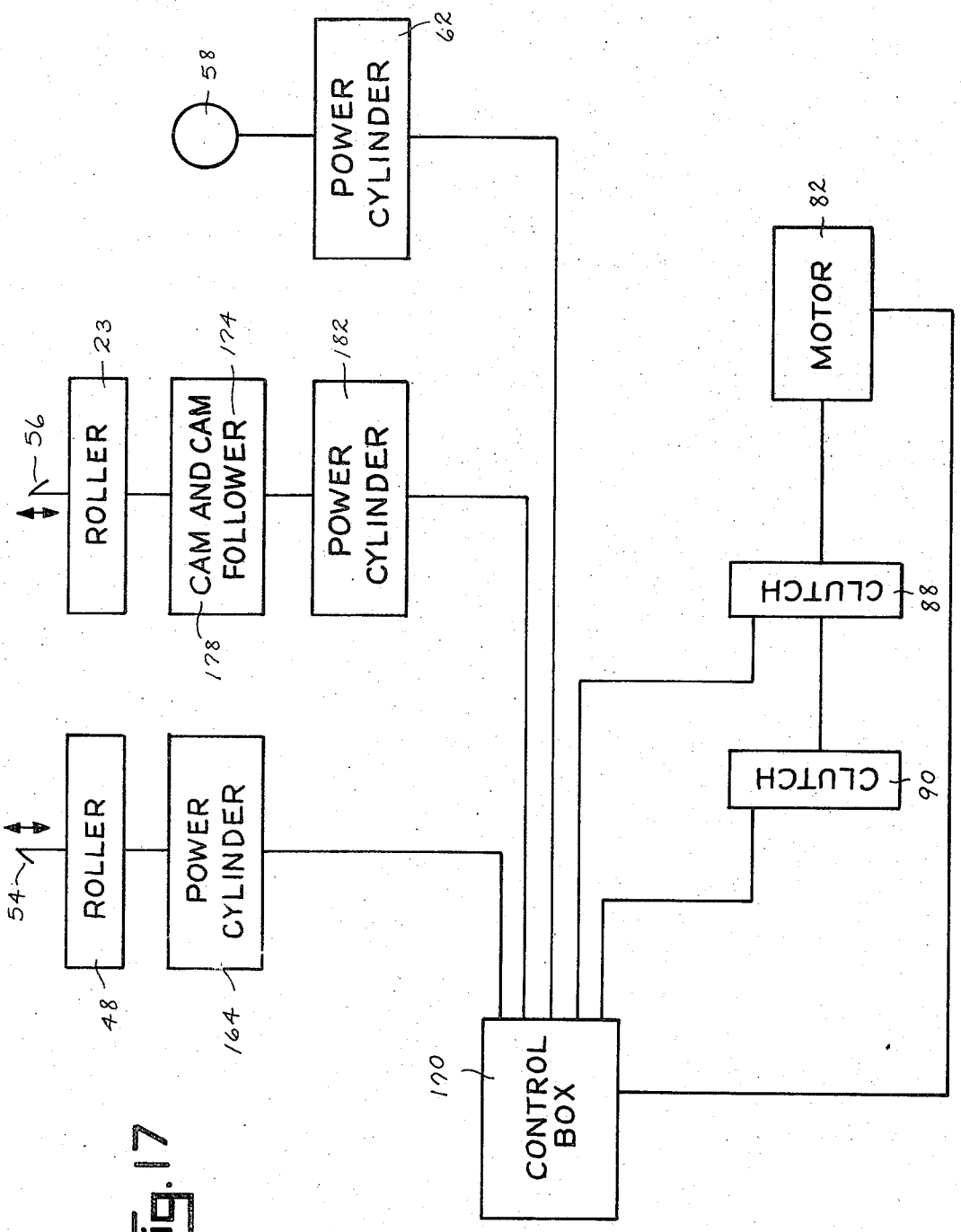

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POWER CYLINDER
62
MOTOR
82
56
ROLLER
23
CAM AND CAM FOLLOWER
124
178
POWER CYLINDER
182
CLUTCH
88
CLUTCH
90
54
ROLLER
48
POWER CYLINDER
164
CONTROL BOX
170

Fig. 17

DEVICE FOR ROLLING SECTIONS OF CARPET

BACKGROUND OF THE INVENTION

This invention relates to apparatus for rolling flexible sheet material and has specific application to a device for rolling sections of carpet.

In the carpet industry there are two types of winders or rollers for preparing carpet sections for shipment. One type of roller is known as the mandrel type while the other type of roller is known as the surface type. In utilizing prior art surface type rollers, the carpet section is fed back side down into the roller where it is wound with its back out and its face which consists of the nap or pile positioned to the inside of the roll. No option is given the users of the prior art devices to roll the carpet section with its face out.

In this invention, the carpet roller is of the surface type and enables the carpet section which is fed back side down into the roller to be rolled either with its face out or back out, depending upon the desire of the user of the roller.

SUMMARY OF THE INVENTION

The carpet rolling device of this invention includes roller means which are engageable with the leading edge of the carpet and which form such edge of the carpet into a roll. Means are provided for causing rotation of the roller means in a first set of directions for rolling the carpet with its back out and an opposite set of directions for rolling the carpet with its face out. Guide means in association with the roller means are provided for assisting in rolling the carpet. The guide means are shiftable between operative and inoperative positions for preventing contact of the leading edge of the carpet with selected roller means depending upon whether the carpet is to be rolled with its back or face out.

Accordingly, it is an object of this invention to provide a device for rolling sections of carpet with either the face or back of the carpet section being out, depending upon the desire of the user of the device.

Another object of this invention is to provide a device for rolling carpet with the nap or pile thereof being positioned at the outside of the carpet roll.

Still another object of this invention is to provide a device for rolling sections of carpet in a rapid manner with the face of the carpet containing the nap or pile being positioned either to the inside or to the outside of the roll, depending upon the desire of the user of the device.

Still another object of this invention is to provide a surface type carpet roller which may be utilized with or without a core and which may roll the carpet with either its face or back to the outside of the roll, depending upon the desire of the user of the roller.

Still another object of this invention is to provide a device for rolling sections of carpet with the face of the carpet section being out.

Other objects of this invention will become apparent upon a reading of the invention's description.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of this invention has been chosen for purposes of illustration and description wherein:

FIG. 1 is a perspective view of the carpet rolling device of this invention with portions of the frame of the device broken away for purposes of illustration.

FIG. 2 is a fragmentary side elevational view of the carpet rolling device of FIG. 1 showing the ends of the device with portions thereof broken away for purposes of illustration.

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2.

FIG. 4 is a fragmentary sectional view taken along line 4—4 of FIG. 2.

FIG. 5 is a fragmentary view of the control device of FIG. 4 showing the cam follower mechanism thereof in a second operative position.

FIG. 6 is a fragmentary view of the control device of FIG. 4 showing the camming mechanism thereof in a second operative position.

FIG. 7 is a fragmentary sectional view taken along line 7—7 of FIG. 2.

FIG. 8 is a fragmentary sectional view taken along line 8—8 of FIG. 2.

FIG. 9 is a fragmentary side elevational view of the drive and clutch control mechanism for the device of FIG. 1.

FIG. 10 is a fragmentary sectional view taken along line 10—10 of FIG. 9.

FIG. 11 is a fragmentary sectional view taken along line 11—11 of FIG. 9.

FIG. 12 is a fragmentary sectional view taken along line 12—12 of FIG. 9.

FIG. 13 is a sectional view of the roller means of the device of FIG. 1 in which the leading edge of a carpet section is being formed into a roll with its back out.

FIG. 14 is a sectional view of the roller means of the device of FIG. 1 in which the leading edge of a carpet section is being formed into a roll with its face out.

FIG. 15 is a sectional view of the roller means of the device of FIG. 1 showing in sequence with FIG. 14 the carpet section being formed into a roll with its face out.

FIG. 16 is a sectional view of the roller means of FIG. 1 showing in sequence with FIGS. 14 and 15 the carpet section being formed into a roll with its face out.

FIG. 17 is a schematic diagram of a part of the actuator and control parts of the device of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment illustrated is not intended to be exhaustive or to limit the invention to the precise form disclosed. It is chosen and described in order to best explain the principles of the invention and its application and practical use to thereby enable others skilled in the art to best utilize the invention.

The carpet roller shown in the drawings includes a frame 10. It is to be understood that the term "carpet" as used herein includes the term "rug." Frame 10, which may be shiftable as a unit longitudinally, supports rollers 12, 14, 16 and 18 in its base portion 11, and rollers 20 and 22 in its head portion 13 which is shiftable relative to base portion 11. Rollers 20 and 22 in the head of frame 10 are journaled at their opposite ends in suitable bearing supports 24. A pivot roller 23 parallels rollers 20 and 22 and is journaled within bearing supports 24. The ends of pivot roller 23 extend outwardly of supports 24 and terminate next to side walls 28 of frame 10. A guide block 25 is journaled upon

each end of shaft 23. Guide blocks 25 are carried between vertical guides or rails 26 attached to frame side walls 28. Bearing supports 24 are connected by chains to a counter weight 32 carried by frame 10 exteriorly of one of its side walls 28. With counter weight 32, rollers 20 and 22 in head portion 13 of the frame can be raised and lowered as a unit with little effort. Guide blocks 25 and rails 26 prevent movement of rollers 20 and 22 except in a vertical plane. A pneumatically actuated power cylinder 34 is connected to weight 32 to raise head 13 from contact with the carpet section at the completion of the rolling operation in preparation for ejection and to set the amount of carpet applied pressure it takes to lift the head during formation of the carpet roll.

A feed table 36 is positioned at the feed side of the roller device. Feed table 36 includes rollers 12 and 14 which are journaled in suitable bearing mounts connected to frame 10 and which have a plurality of laterally spaced endless belts 38 extending therearound. Each roller 16, 18, 20 and 22 carries a plurality of laterally spaced tires 40 preferably formed of a rubber or similar type material capable of making frictional contact with the carpet section. The tires 40 carried by rollers 20 and 22 preferably are in spaced overlapping relationships, as shown in FIG. 3.

A flexible band member 42 is located between adjacent tires 40 carried upon roller 16 Similar band members 44 are located between adjacent tires carried upon roller 20. Each band member 42 has one end connected to a beam 46 and its opposite end connected to a pivot roller 48 which extend longitudinally of and are supported by the base 11 of frame 10. Each band member 44 has one end connected to beam 50 and its opposite end connected to pivot roller 23 which extend longitudinally of frame 10 and which are connected for vertical shiftable movement to bearing supports 24 of the head 13 of the frame. Band members 42 and 44 are formed of a flexible shape retaining material, such as stainless steel. Beams 46 and 50 are fixed against rotation, while rollers 23 and 48 are journaled for rotative movement. The intermediate portion of each band member 42 is formed into a finger 54 (see FIGS. 13–16) which serves as a guiding or camming element whose function will be later defined. Each band member 44 has its intermediate portion formed into a finger 56 which also serves as a camming or guiding element whose function will be later described. A hold-down roller 58 extends longitudinally of frame 10 and is positioned spacedly above feed table 36. Roller 58 is carried between shiftable arms 60 which are best shown in FIGS. 7 and 8. Opposite end portions of roller 58 are journaled within the upper ends of arms 60. The lower ends of arms 60 are pivotally connected to the base 11 of frame 10. Hold-down roller 58 is shiftable between the solid line and broken line positions shown in FIG. 3 through the actuation of a pneumatic power cylinder 62 anchored to frame 10.

MANNER OF OPERATION

First, the manner of rolling the carpet section with its back out will be described. Referring to FIG. 13, rollers 16, 18, 20 and 22 are caused to rotate in the set of directions indicated by arrows 64. Hold-down roller 58 is located in its solid line position as illustrated in FIG. 3. Leading edge 66 of carpet section 68 is fed with its back 70 down across feed table 36 and between rollers 16 and 20. The head 13 of frame 10 which includes rollers 20 and 22 is located in the lower position shown in FIG. 13 with the tires 40 of rollers 18 and 22 slightly overlapping. Fingers 56 are positioned so as to extend beyond the periphery of the tires 40 carried by roller 20. Fingers 54 are retracted and positioned so as not to protrude beyond the outer periphery of tires 40 carried by roller 16. As leading edge 66 is fed between rollers 16 and 20, back 70 of the carpet section 68 contacts in sequential fashion the peripheral edges of tires 40 of rollers 16, 18, 22 and 20, causing the carpet edge to make a circular path in the direction of arrow 72 in FIG. 13. Finger 56 serves two purposes: First, it urges the leading edge 66 of the carpet section downwardly into contact with the tires 40 of rollers 16 and 18 as the carpet section enters the rug rolling device; and, secondly, it contacts back 70 of the carpet section upon the completion of its first turn so as to urge leading edge 66 into a circle. As the carpet section 68 is advanced by table 36 into the rolling device, the rolled section of carpet formed between rollers 16, 18, 20 and 22 increases in diametrical size, causing the head 13 of frame 10 to be urged upwardly as illustrated by the broken line outlines of rollers 20 and 22. The head of frame 10 is so counterbalanced by weight 32 and the setting of power cylinder 34 that the increase in diametrical size of the carpet as it is rolled will apply sufficient pressure to the head to cause the head to shift upwardly.

Upon the start of the upward movement of frame head 13, roller 23 is rotated causing fingers 56 to be retracted and positioned within the outer periphery of tires 40 carried by roller 20. Once the carpet section 68 has been rolled and, if desired, wrapped in a paper or cloth cover, arms 74 connected to longitudinally extending roller 76 and located between selected tires 40 of roller 16 will be pivoted counterclockwise as viewed in FIG. 13 by actuation of a power cylinder (not shown) to cause the rolled section of carpet to be ejected from the machine and rolled down discharge table 78 to a waiting depository.

When it is desired to roll the carpet section 68 with its back 70 in and face 71 out, shafts 16, 18, 20 and 22 are caused to rotate in the set of directions illustrated by arrows 80 in FIGS. 14 and 15. Hold-down roller 58 is shifted from its solid line position to its broken line position shown in FIG. 3 through the actuation of power cylinder 62. FIGS. 14, 15 and 16 show in sequential fashion the steps of rolling carpet section 68 with its face 71 out. Leading edge 66 of carpet section 68 is fed across feed table 36 with its back 70 down in the same fashion as if the carpet section were to be rolled with its back out. Fingers 54 are positioned so as to extend beyond the periphery of tires 40 carried by roller 16. Fingers 56 are retracted and positioned so as not to extend beyond the outer periphery of tires 40 carried by roller 20. As leading edge 66 of carpet section 68 is advanced between rollers 16 and 20, face 71 of the carpet section first contacts fingers 54 which urge edge 66 into contact with tires 40 carried by roller 20 and then, in sequential steps, into contact with tires 40 carried by rollers 22, 18 and 16. After contacting the outer periphery of tires 40 carried by roller 16, leading edge 66 of the carpet section will again engage fingers 54 and be urged into a circular configuration with its face 71 being located outwardly as shown in FIG. 15. As the roll of carpet begins to form, the head

13 of frame 10, which includes rollers 20 and 22, will be urged upwardly due to the increase in size of the roll of the carpet section. Upon the initial upward movement of frame head 13, roller 48 to which fingers 54 are connected is rotated causing fingers 54 to be retracted and positioned within the outer periphery of tires 40 carried by roller 16. As the roll of carpet section increases in diameter, the roll will move or "walk" (see FIG. 16) upwardly over tires 40 carried by roller 16 and toward hold-down roller 58 which prevents the roll from leaving the machine. Once rolling of carpet section 68 with its face 71 out has been completed and the roll, if desired, wrapped in cloth or paper, arms 74 will be actuated to eject the rolled carpet section from the rolling device, down table 78, and into a depository.

Fingers 54 and 56 serve two important functions when located in their extended positions: First, the fingers prevent any initial contact of the leading edge of the carpet section with the tires 40 carried by the roller with which the fingers are associated; and, secondly, the fingers are utilized to urge the leading edge of the carpet section into a circular path as it completes its first revolution between rollers 16, 18, 20 and 22. It is preferable that fingers 54 and 56 be designed so that with the fingers extended the leading edge of the carpet will be prevented from contacting the peripheral edges of the tires 40 carried by the finger associated roller until the carpet edge is about to complete its first revolution, as seen in FIGS. 13 and 14. Hold-down roller 58 serves an initial function, whether the rolling device of this invention is utilized to roll the carpet section back out or face out, of assisting feed table 36 to direct the leading edge of the carpet section between rollers 16 and 20. Additionally, hold-down roller 58, when the rolling device is being utilized to roll the carpet section with its face out, serves to prevent the rolled carpet section from advancing entirely out from between rollers 16 and 20 as the rolled carpet section "walks" toward feed table 36, to hold the feed portion of the carpet section against the roll as it is being formed, and because of its smooth outer surface, to iron out streaks or wrinkles formed by tires 40 in face 71 of the carpet section during the rolling operation.

DRIVING MECHANISM

The drive mechanism for the above described carpet roller can best be described by referring to FIG. 9. An electric drive motor 82 is mounted to the base of frame 10. An elongated drive shaft 84 extends longitudinally of frame 10. Drive shaft 84 is mounted for rotative movement in suitable frame connected bearing blocks. One end of shaft 84 is drive connected to the shaft of motor 82 by means of a chain drive combination. Shaft 84 carries two longitudinally spaced clutches 88 and 90. Clutches 88 and 90 are of the electrically actuated type. Sprockets 94 and 96 are journaled upon shaft 84. Sprocket 94 is operatively associated with clutch 88 and sprocket 96 is operatively associated with clutch 90. Actuation of a clutch 88 or 90 magnetically couples the associated sprocket to the clutch so that the shaft 84 and coupled sprocket rotate as one. A shaft 92 is journaled in suitable bearing blocks connected to frame 10. Sprockets 98 and 100 are carried by shaft 92. Sprockets 96 and 100 are drive connected by a chain 102 and sprockets 94 and 98 are drive connected by a chain and idler combination 104. With motor 82 rotating shaft 84 in one direction, actuation of clutch 88 will cause shaft 92 to be rotated in one direction and actuation of clutch 90 will cause shaft 92 to be rotated in the opposite direction. In this manner, clutches 88 and 90 allow drive shaft 92 to be reversed in direction of rotation.

Each arm 60 of hold-down roller 58 is journaled about a short shaft 106. Shafts 106 are coaxially oriented and carried within suitable bearing blocks secured to the base 11 of frame 10. A sprocket 108 and belt pulley 110 are secured together and journaled for rotation together upon one of the shafts 106. Hold-down roller 58 carries a belt pulley 112 which is positioned in vertical alignment with pulley 110. An endless drive belt 114 passes around pulleys 110 and 112. An idler roller 116 engages belt 114 between pulleys 110 and 112 and is carried by the adjacent arm 60 of the hold-down roller. Roller 116 serves to prevent belt 114 from contacting various operating components of the carpet rolling device as the hold-down roller is shifted between the solid and broken line positions shown in FIG. 3. A pneumatically actuated power cylinder 62, best seen in FIG. 8, is used for shifting roller 58 and is connected between the base of frame 10 and one arm 60 of the hold-down roller. Depending upon the width of the carpet rolling device, it may be necessary to utilize two power cylinders 62, each connected to an arm 60 of the hold-down roller. There is a slip fit between belt 114 and pulley 112 of the hold-down roller. This fit between belt 114 and pulley 112 permits the roller 58 to be driven slightly faster than feed table 36 and upon contacting the carpet section as it enters the carpet roller to be slowed to assume the speed of the carpet while placing the carpet section under sufficient tension to ensure its smooth feed into the rolling device.

Drive shaft 84 carries a sprocket 120. Sprocket 120 is connected by a drive chain 122 to a sprocket 124 which is connected to roller 12 constituting a part of feed table 36. Drive shaft 84 rotates at a continuous speed in one direction upon operation of motor 82. Chain 122 also makes driving engagement with sprocket 108 and causes the rotation of both belts 38 of feed table 36 and hold-down roller 58. A sprocket 126 is mounted to shaft 92.

A sprocket 128 is mounted to roller 16. Sprockets 126 and 128 are connected by an endless chain 130. A sprocket 132 is connected to roller 16. A drive chain 134 connects sprocket 132 to a sprocket 136 carried by roller 18. Thus, the rotation of drive shaft 92, through interconnecting drive chains 130 and 134 and associated sprockets, will cause the rotation of rollers 16 and 18. A sprocket 138 is carried by roller 16. Sprocket 138 is drive connected by a pair of endless chains 140 and 142 to a sprocket 144 journaled upon pivot roller 23 carried in the head 13 of frame 10. Drive chains 140 and 142 are supported upon a pivot arm having pivotally connected parts 146 and 148. Arm parts 146 and 148 have their free ends journaled upon roller 23 and roller 16 respectively. A pair of interconnected sprockets 150 are rotatably carried at the pivot connection of arm parts 146 and 148 and serve to drive connect chains 140 and 142 so that rotational movement of roller 16 will impart rotational movement to sprocket 144 journaled upon roller 23. Sprockets 152 and 154 are coupled to sprocket 144 and journaled upon roller 23. A drive chain 156 connects sprocket 152 to a sprocket

158 which is connected to roller 22. A chain 160 connects sprocket 154 to a sprocket 162 which is connected to roller 20. Rotation of roller 16 causes the rotation of shafts 20 and 22 of all vertical orientations of the head 13 of frame 10 with arm parts 146 and 148 serving to transmit such rotary motion in a manner well known in the art.

The following is a description of the means for actuating fingers 54 and 56 which are associated with rollers 16 and 20 respectively. As previously mentioned, fingers 54 and 56 constitute parts of band members 42 and 44 which are constructed from flexible shape retaining material. One end of each band member is fixedly secured to a stationary beam 46 or 50. The opposite end of each band member is secured to a roller 23 or 48. Movement of roller 48 is accomplished by power cylinder 164 which is best seen in FIG. 7. A one-piece rigid arm 168 is secured to roller 48 with power cylinder 164 being connected between arm 168 and the base 11 of frame 10. Power cylinder 164 is actuated through two control circuits. One control circuit will cause actuation of power cylinder 164 to position fingers 54 in their extended positions as shown in FIG. 14 or their retracted positions as shown in FIG. 13, depending upon whether the device is to be utilized to roll the carpet section with its face out or back out respectively. The second control circuit includes a microswitch 172 which is carried between a pair of vertical guides 26 and which contacts guide block 25 when frame head 13 is in its lower position as seen in FIG. 4. As the head 13 of frame 10 is raised during forming of the carpet roll with its face out, the guide block 25 will be raised from contact with switch 172 to cause actuation of power cylinder 164 and the retraction of fingers 54.

The rotation of roller 23 to extend and retract fingers 56 associated with head roller 20 is accomplished in this manner: Each end of pivot roller 23 is journaled within a guide block 25 which is shiftable between vertical guides 26 at each end of frame 10. A cam follower 174, which includes a roller 176, is secured to one end of roller 23 adjacent a pair of vertical guides 26. One of the vertical guides, hereinafter designated as guide 26', is mounted to frame 10 so as to be shiftable in a vertical plane. Guide 26' includes a camming surface 178 which has an indentation 180 formed therein, see FIGS. 4–6. A power cylinder 182 is mounted between frame 10 and vertical guide 26' so as to cause guide 26' to be shifted up and down relative to its adjacent parallel guide 26 and cam follower 174. With vertical guide 26' in the upper position shown in FIG. 4, roller 176 of cam follower 174 will rest within indentation 180 in the guide. With cam follower 174 resting within indentation 180 in guide 26', fingers 56 are located in their extended positions and head 13 of frame 10 is located in its lower position in preparation to receive the leading edge of the carpet section which will be rolled with its back out as shown in FIG. 13. As the first turn or two of carpet section is completed during actuation of the rolling device, the head 13 of frame 10, including roller 23, will be shifted upwardly as indicated by arrow 184 in FIG. 5, causing roller 176 of cam follower 174 to move out of indentation 180 of vertical guide 26' which is held in a stationary position by power cylinder 182. This movement of cam follower 174 causes rotation of roller 23 in a clockwise direction as the roller is viewed in FIG. 3, thus resulting in fingers 56 being shifted into their retracted positions.

When it is desired to utilize the carpet roller of this invention to roll the carpet section with its face out, fingers 56 must be retracted as shown in FIG. 14 prior to the introduction of the leading edge of the carpet section into the device. This is accomplished, as shown in FIG. 6, by actuating power cylinder 182 to cause vertical guide 26' to be shifted downwardly while the head 13 of frame 10 is in its lower position. This action causes cam follower 174 to be rotated and pivot roller 23 shifted from the position illustrated in FIG. 4 to the position illustrated in FIG. 6 without vertical movement of frame head 13. In this manner, fingers 56 are retracted prior to the raising of frame head 13.

In the rolling device of this invention the carpet sections are rolled at the approximate speed of 180 lineal feet per minute. Each carpet section is urged between rollers 16 and 20 at a constant speed by feed table 36. In rolling a carpet section with its back out, the tires 40 carried by rollers 16, 18, 20 and 22 contact the same carpet surface, that is the back of the carpet. When the carpet section is rolled with its face out, the belts 38 of feed table 36 will engage the back of the carpet section while tires 40 of rollers 16, 18, 20 and 22 will engage the face of the carpet. Because of the thickness of the pile or nap at the carpet face, rollers 16, 18, 20, and 22 must be caused to rotate slightly faster in the face out operation than they are caused to rotate in the back out operation. Thus, the drive for rollers 16, 18, 20 and 22 must be slightly speeded up when the carpet section is rolled with its face out.

In FIG. 10, the arrows shown on sprockets 96 and 100 indicate the direction of rotation of the sprockets in rolling the carpet section with its back out. In FIG. 11, the arrows shown on sprockets 94 and 98 indicate the direction of rotation of the sprockets in rolling the carpet section with its face out. Sprockets 94 and 96 are of the same size. Sprocket 100 is slightly larger than sprocket 98 to cause rollers 16, 18, 20 and 22 to rotate approximately 1.030 times faster during a face out operation than during a back out operation. It is preferable to set the speed of rollers 16, 18, 20 and 22 to accommodate the thickest carpet pile or nap which the rolling device will take in a face out operation and utilize a potentiometer in association with clutch 88 to allow slippage between sprocket 94 and shaft 84 and a slow down of the speed of the drive when the actual pile or nap thickness of the carpet section being rolled is less than the maximum design carpet pile or nap thickness. In all rolling operations, the peripheral speed of tires 40 on rollers 16, 18, 20 and 22 preferably will slightly exceed the peripheral speed of belts 36 of feed table 34 so as to maintain slight tension on the carpet section as it is fed into the machine.

In FIG. 17 a schematic drawing of a portion of the control circuit for the carpet roller is shown. When it is desired to roll the carpet section with its back out, the proper button is pushed on control box 170 to actuate power cylinder 164 to withdraw fingers 54 and to actuate power cylinder 182 to position cam 178 in the location shown in FIG. 4 to extend fingers 56. Power cylinder 62 is actuated to position hold-down roller 58 in its outermost location. Clutch 90 is then actuated to couple sprocket 96 for rotation with shaft 84 and motor 82 is turned on to cause the rotation of rollers 16, 18, 20 and 22 and of feed table 36 (not shown schemati-

cally in FIG. 17). When it is desired to roll the carpet section with its face out, another button is pushed on control box **170** to cause actuation of power cylinders **164, 182** and **62,** causing the extension of fingers **54,** the retraction of fingers **56,** and the positioning of the hold-down roller **58** in its innermost position as shown in broken lines in FIG. **3.** Clutch **88** is then actuated to couple sprocket **94** for rotation with shaft **84** and motor **82** is turned on.

A plurality of laterally spaced coil spring belts **190** are passed over rollers **16** and **18.** Belts **190** are located between tires **40** and serve to guide the leading edge of the carpet section during formation of the first turn of the carpet roll. The carpet roller of this invention can be used to roll the carpet with or without a core. When it is desired to roll the carpet about a core, belts **190** are used to hold and rotate the core during the formation of the initial turn of carpet.

It is to be understood that the invention is not to be limited to the details above given, but may be modified within the scope of the appended claims.

What I claim is:

1. A device for rolling a section of carpet having a face for walking upon and a back, comprising roller means engageable with the leading edge of said carpet section for forming said edge into a roll, means causing rotation of said roller means in one set of directions for rolling said carpet section with its back out and in an opposite set of directions for rolling said carpet section with its face out, and guide means associated with said roller means for assisting in said rolling of the carpet section, said guide means being shiftable between operative and inoperative positions depending upon whether said carpet section is to be rolled with its back or face out, said rolling device having feed and discharge ends, said roller means including an upper roller and two lower rollers, conveyor means for directing the advancement of said carpet section into said feed end and between said upper and lower rollers, said roller rotating means causing said lower rollers to rotate in the direction of advancement of said carpet section and causing said upper roller to rotate in a direction opposite to said advancement of said carpet section for rolling the section with its back out, said roller rotating means causing said lower rollers to rotate in a direction opposite to said advacement of said carpet section and causing said upper roller to rotate in the direction of said advancement of said carpet section for rolling the section with its face out, said guide means including finger means, one of said lower rollers being located nearer said feed end than the other of said lower rollers, each lower and upper rollers having a peripheral edge adapted to contact said carpet section and urge said section into a roll, said finger means being associated with each of said one lower roller and upper roller and being shiftable between an operative position in which said finger means projects beyond the periphery of its associated roller to direct said carpet section away from such associated roller upon entry of the carpet section between said upper and lower rollers and an inoperative position in which said finger means is located within the periphery of its associated roller to permit contact of the carpet section with such associated roller, means for shifting each finger means between its said operative and inoperative positions, the finger means associated with said upper roller being located in its said operative position and the finger means associated with said one lower roller being located in its said inoperative position when said carpet section is to be rolled with its back out, and said finger means associated with said upper roller being located in its said inoperative position and said finger means associated with said one lower roller being located in its said operative position when said carpet section is to be rolled with its face out, and wherein said conveyor means is adapted to contact the back of said carpet section and to feed said section between said upper and lower rollers at a constant feed rate whether rolling said carpet section with its face in or face out, said upper and lower rollers adapted to contact the back of said carpet section in rolling the section with its back out and to contact the face of said section in rolling the section with its face out, said roller rotating means including means for increasing the rotational speed of said upper and lower rollers relative to the speed of said conveyor means when said carpet section is rolled with its face out.

2. A device for rolling a section of carpet having a face for walking upon and a back, comprising roller means engageable with the leading edge of said carpet section for forming said edge into a roll, means causing rotation of said roller means in one set of directions for rolling said carpet section with its back out and in an opposite set of directions for rolling said carpet section with its face out, and guide means associated with said roller means for assisting in said rolling of the carpet section, said guide means being shiftable between operative and inoperative positions depending upon whether said carpet section is to be rolled with its back or face out, said rolling device having feed and discharge ends, said roller means including an upper roller and two lower rollers, conveyor means for directing the advancement of said carpet section into said feed end and between said upper and lower rollers, said roller rotating means causing said lower rollers to rotate in the direction of advancement of said carpet section and causing said upper roller to rotate in a direction opposite to said advancement of said carpet section for rolling the section with its back out, said roller rotating means causing said lower rollers to rotate in a direction opposite to said advancement of said carpet section and causing said upper roller to rotate in the direction of said advancement of said carpet section for rolling the section with its face out, said guide means including finger means, one of said lower rollers being located nearer said feed end than the other of said lower rollers, each lower and upper rollers having a peripheral edge adapted to contact said carpet section and urge said section into a roll, said finger means being associated with each of said one lower roller and upper roller and being shiftable between an operative position in which said finger means projects beyond the periphery of its associated roller to direct said carpet section away from such associated roller upon entry of the carpet section between said upper and lower rollers and an inoperative position in which said finger means is located within the periphery of its associated roller to permit contact of the carpet section with such associated roller, means for shifting each finger means between its said operative and inoperative positions, the finger means associated with said upper roller being located in its operative position and the finger means associated with said one lower roller being located in its said inoperative position when said carpet section is to

be rolled with its back out, and said finger means associated with said upper roller being located in its said inoperative position and said finger means associated with said one lower roller being located in its said operative position when said carpet section is to be rolled with its face out, and wherein said conveyor means is adapted to contact the back of said carpet section and to feed said carpet section between said upper and lower rollers at a constant feed rate whether rolling said carpet section with its face in or face out, said upper and lower rollers adapted to contact the back of said carpet section when rolling the section with its back out and to contact the face of said section when rolling the section with its face out, said roller rotating means including means for increasing the rotational speed of said upper and lower rollers relative to the speed of said conveyor means in proportion to the carpet pile or nap thickness when said carpet section is rolled with its face out.

3. The rolling device of claim **1** wherein said means for shifting said finger means causes each finger means when in its operative position to be shifted into its inoperative position upon the formation of the roll of carpet section, guiding means for permitting upward shiftable movement of said upper roller upon the formation of said carpet roll, actuation of said means for shifting said finger means out of its said operative position upon formation of said carpet section roll being correlated with said upward shiftable movement of said upper roller, said means for shifting each finger means out of its said operative position including a shiftable camming means, the finger means associated with said upper roller carrying a cam follower means engaging said camming means, means for shifting said camming means relative to said cam follower means to locate said finger means associated with said upper roller in its said inoperative position when said carpet section is being rolled with its face out, said cam follower means being shiftable relative to and independently of said camming means upon upward shiftable movement of said upper roller to locate said last mentioned finger means in an inoperative position when said carpet section is being rolled with its face in.

4. The rolling device of claim **1** wherein each finger means when in its said operative position permits contact of said carpet section with its associated roller upon formation of the first turn of said carpet section between said upper roller and lower rollers.

5. The rolling device of claim **4** wherein said upper roller and lower rollers include longitudinally spaced tires, the peripheral edges of said tires adapted to contact said carpet section and urge said section into a roll.

6. The rolling device of claim **5** wherein said finger means are carried between said tires.

7. The rolling device of claim **1** and other roller means located at the feed end of said device and being shiftable from a position adjacently over said conveyor means toward said upper roller and into a position adjacent said upper roller to engage said carpet section as said section is fed between said upper and lower rollers for preventing the discharge of the carpet section from said feed end as the carpet section is being rolled with its face out.

8. The rolling device of claim **1** wherein said roller means includes another upper roller, one of said upper rollers being located nearer said feed end than the other upper roller.

9. The rolling device of claim **7** and drive means for rotating said other roller means in the direction of said carpet section advancement.

10. The rolling device of claim **2** wherein said roller rotating means includes a drive mechanism interconnected to said upper and lower rollers by clutch means permitting slippage between said rollers and drive mechanism and a resulting variation in rotational speed of said rollers.

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