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CREEL STRUCTURE

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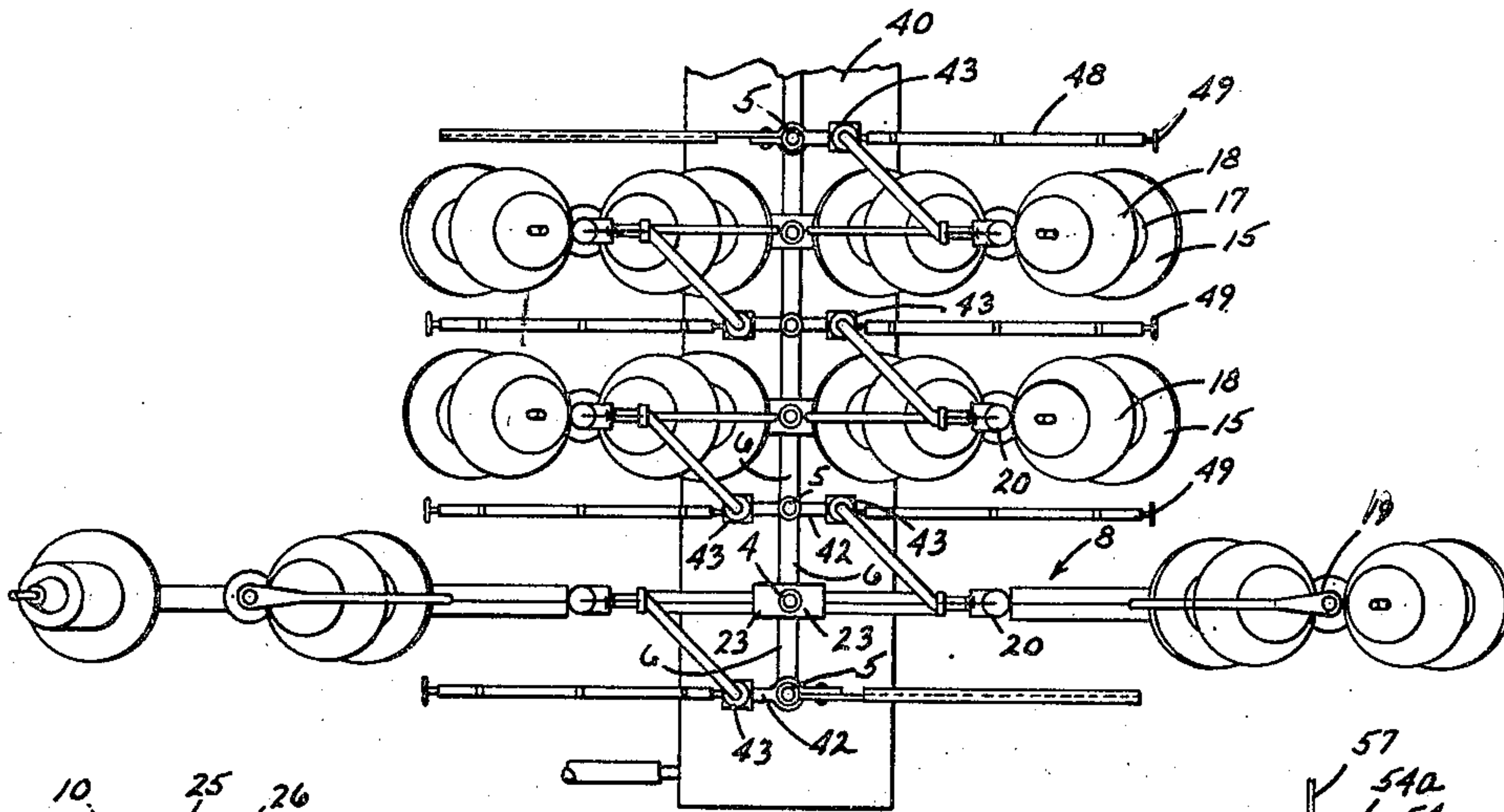


Fig. 2

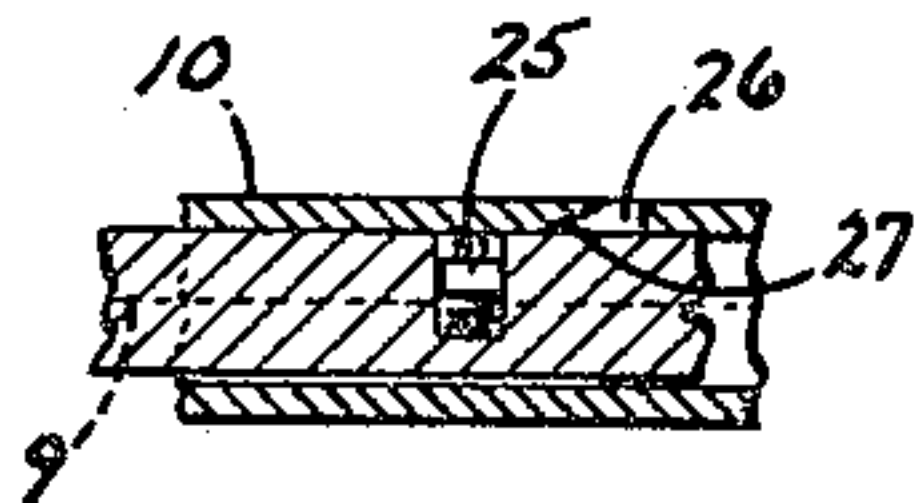


Fig. 4

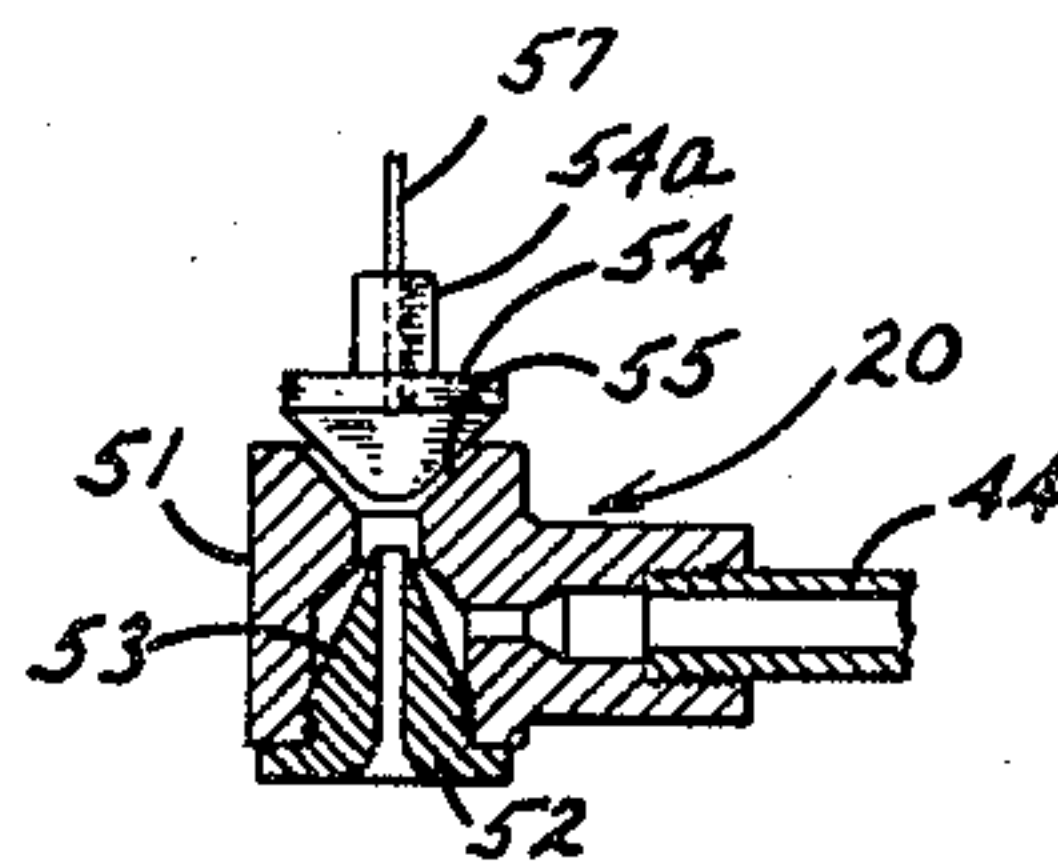


Fig. 5

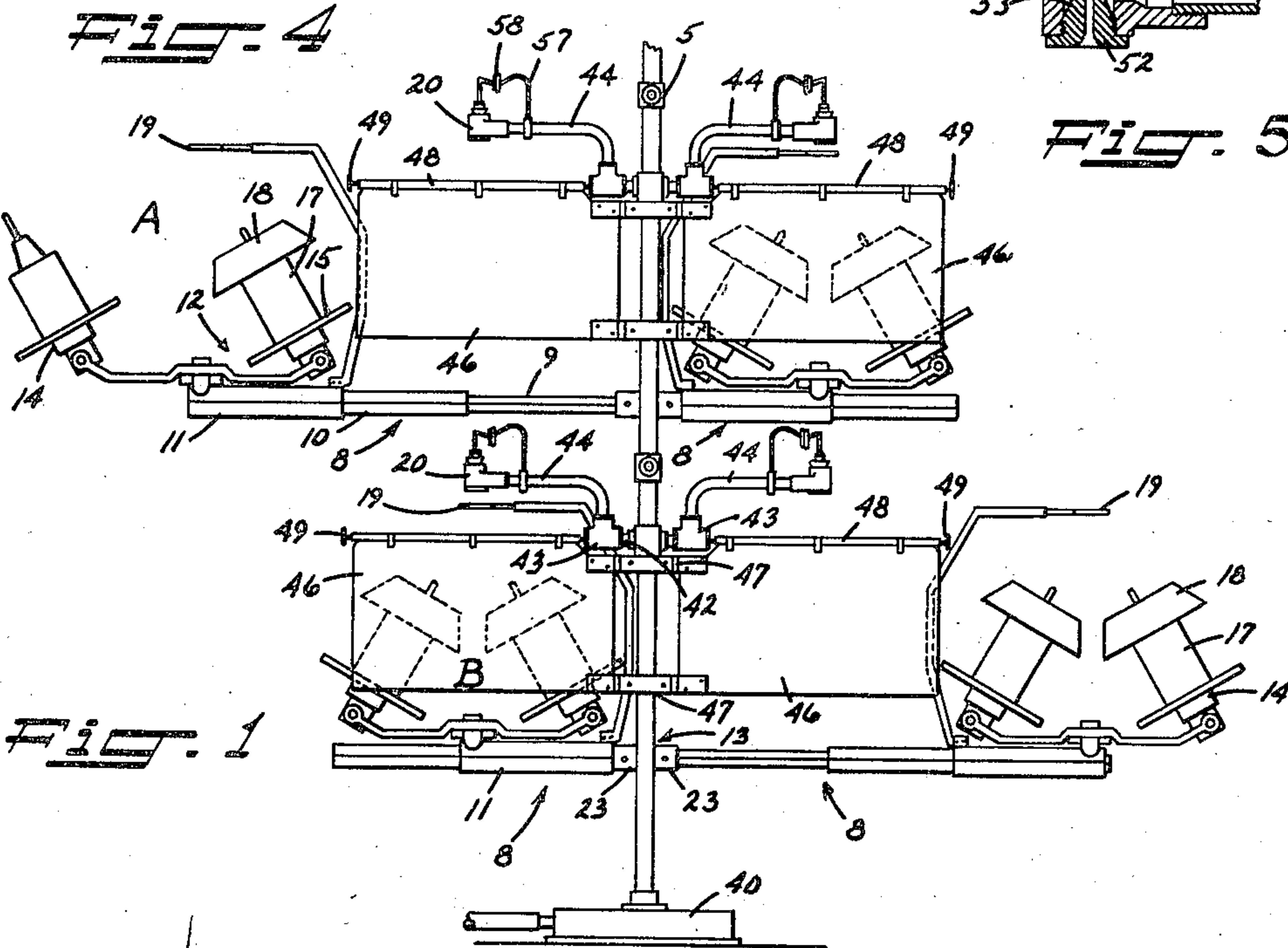


Fig. 1

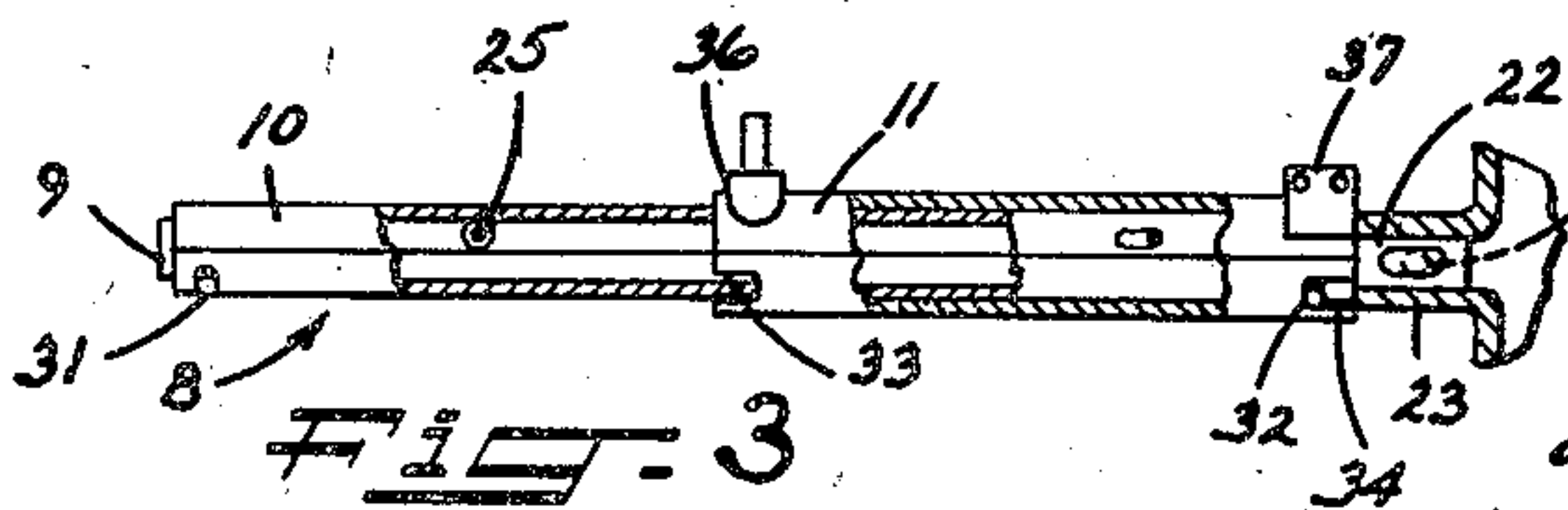


Fig. 3

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## CREEL STRUCTURE

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1 Claim. (Cl. 242—131)

This invention relates to improvements in creels such as are employed to support a large number of strand packages so that the yarn may be led therefrom into a weaving machine, or wound from the creel onto a warp beam.

It is an object of the invention to provide a creel structure which is substantially more compact and economical as to the space requirements for a designated package storage capacity than creels of conventional design. It is also an object to provide a creel in which the separate package supports are more accessible and generally more conveniently located for loading. Another object is to provide creels constructed in accordance with these prior stated objects with self-lacing tension devices mounted adjacent package-supporting stations. Other objects, features and advantages will become obvious from the following description of the invention and the drawing relating thereto in which

Fig. 1 is a fragmentary elevation of a creel;

Fig. 2 is a plan view of part of the creel partly illustrated in Fig. 1;

Fig. 3 is a view with portions cut away of a telescopic standard which constitutes a portion of the creel illustrated in Figs. 1 and 2;

Fig. 4 is an enlarged fragmentary section of a portion of the standard shown in Fig. 3; and

Fig. 5 is an elevation partially in section of a self-lacing tension device of the creel of Figs. 1 and 2.

Creel structure in accordance with the present invention comprises a plurality of individual package holders supported by pairs on pivotal supports which are in turn mounted on parallel horizontal telescopic standards attached to an upright frame. Mounted over each unwinding station corresponding to the position for operation of each package holder is a self-lacing strand tension device connected with a reservoir of gas under pressure such as a compressed air supply. A hollow frame may be utilized for conducting the gas to the tension devices as well as for supporting the devices and the package supports.

Figs. 1 and 2 illustrate by elevation and plan views, respectively, upright frame members 4 and 5 which are connected in a horizontal direction lengthwise of the creel by frame members 6. Attached to the upright members 4 are a plurality of similar standards 8 which, in the embodiment shown, comprise three sections 9, 10 and 11 in telescopic relationship. Section 9 of each standard is secured at one end to a fitting 13 constituting a portion of the upright member 4. In Fig. 1, the standard 8 is shown extended to a position A wherein a pivotal elongate support 12 is positioned outwardly from the frame with respect to the rest of the creel. The support 12 supports a pair of package holders 14 and 15 which may be tilted to either of the positions shown with respect to axes that extend in transverse spaced relationship with the pivotal axis of the support on opposite sides thereof. As shown, the pivotal axis of the support 12 is approximately vertical and the tilting axes

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of the holders 14 and 15 are substantially horizontal and spaced approximately equidistantly in opposite directions from the pivotal axis of the support 12. The holder 15 is tilted to the normal operating position. When loaded, a package is held in concentric relationship with the longitudinal axis of the cylindrical portion 17 of the holder. The unwinding of strand from such a package is facilitated by a frusto-conical shield 18. The strand travels from such a package through the eye 19a of a guide 19 and thence through a self-lacing tension device 20 which serves also as a guide as the strand passes from the balloon surrounding the package being unwound toward the strand-discharging end of the creel.

The holder 14 is tilted outwardly to a position which facilitates the placing of a package thereon for unwinding. Normally, the leading yarn end of the package, immediately after it is placed on its respective holder, is fastened to the tail end of the other package supported on the other holder of the support so that the unwinding of packages from a single support may be continuous. Holder 14 is shown with shield 18 thereof removed. Such removal is necessary in placing a package on the holder. B indicates a support in normal operating position adjacent the upright portion of the frame with the telescopic standard 8 retracted. The guide 19 is mounted on section 11 of the standard so that when the support 12 is positioned as indicated by B, its eye is disposed in generally coaxial relationship with, and below, the central aperture of the tension device 20.

From Figs. 1 and 2 it is readily obvious that the support 12 may not be rotated about its pivotal axis while the standard on which it is mounted is fully retracted toward the frame portion 4 since the diameter of rotation of the outermost portions of the support and/or portions of the holders mounted thereon is greater than the spacing between adjacent standards or between adjacent baffles which extend along planes midway between adjacent standards. To rotate a support and its respective holders inclined to their operating positions, the telescopic standard 8 thereof must be extended to a position such as that shown in the lower right of Fig. 1 whereby the support and the holders thereon may be rotated free and clear of other creel portions, such as the holders and/or any packages supported thereon of adjacent fully retracted standards.

During the loading of a holder with the standard therefor extended, the guide 19 serves as an auxiliary guide through which the strand leaving the package being unwound may pass in an axial direction from the package through the guide 19 and thence to the device 20. Thus, one holder of a pivotable support may be loaded without any interruption in the withdrawal of strand from the package supported by the other holder. The strands passing upwardly from the various unwinding stations of the creel through the various tension devices 20 thereupon pass in a generally horizontal direction longitudinally of the creel toward a guide means (not shown) such as an eye bar normally provided at one end of the creel.

Fig. 3 illustrates one of the standards 8 with portions broken away to illustrate concealed structure thereof. The showing of the standard in Fig. 3 corresponds to position B in Fig. 1 wherein the standard is retracted for normal package-unwinding operation. The section 9 of smallest cross section extends almost the full length of the figure and includes an end-portion 22 which is secured within the hollow extension 23 of one of the fixtures 13 of the frame members 4. The end-portion 22 may be secured by means such as a screw or a rivet 22a. The section 10, extending in exterior telescopic relationship with the section 9, may be nearly as long as the section 9 except for the end-portion 22 thereof.



The movement of the section 10 lengthwise of the section 9 is limited in one direction by extension 23 of the fitting 13 and in the other direction by a detent 25, such as shown in Fig. 4, which moves into an aperture 26 of the section 10 when this section is moved lengthwise of the section 9 in a direction away from the frame. Aperture 26 is provided with a beveled surface 27 which permits the movement of the section 10 relative to the section 9 toward the frame from its outermost position by a gentle manually-applied pressure. The section 11 readily traverses the exterior surface of section 10 lengthwise thereof and its movement is limited therealong by pins 31 and 32 which extend outwardly from the surface of the section 10 to engage the peripheries of slots 33 and 34, respectively, in the end-portions of the section 10. Consequently, in moving the section 11 from the position shown in Fig. 3 to position A of Fig. 1, section 11 will move along section 10 until pin 31 is engaged. Thereafter, the section 10 will move along the section 9 until the head of detent 25 moves into the aperture 26. Section 11 comprises also a pivot pin 36 secured to an end-portion thereof for supporting the holder 12, and a bracket 37 to which the shank portion of the guide 19 may be attached by fasteners such as rivets or screws.

Disposed alternately between the upright frame members 4 are hollow frame members 5 connected in communicating relationship with a hollow base member 40 of the frame. The injector-type tension devices 20 may be supported as shown from the frame members 5 by conduits each of which comprises a nipple 42, a valve 43 and a tube 44. A plurality of baffles 46 are supported midway between the operating position occupied by packages supported by adjacent standards extending at the same level from the frame members 5. The baffles are attached by clamp members 47 secured to the uprights 5. The baffles 46 prevent the engagement of the strands within the balloons formed around packages being unwound from the package supports of adjacent standards. Extending along the upper edge of each baffle and attached thereto is a tube 48 through which extends a push rod 49 for working the valve 43.

The tension device 20 comprises, as shown in Fig. 5, a body portion 51, a generally conical fitting 52 secured within the central passageway of the body portion to form an annular chamber 53 extending upwardly and radially inwardly to join with the passageway, and a weight 54 which frictionally engages a strand passing upwardly and centrally through the guide and over the tapered seating surface 55 thereof. A flexible guide rod 57 extends downwardly within a central aperture of the weight to prevent the weight from being blown clear of the guide when air is passed through the tube 44 into the chamber 53 to lace a strand upwardly through the device. Other ring-type weights 58 are supported on a looped portion of the guide rod 57 to adjust the free end-portion of the desired level. Contiguous passage for air or other gas to any one of the devices 20 is provided through the hollow frame base 40, an upright hollow member 5 attached thereto, a nipple 42, a valve 43 and a tube 44 when the valve is actuated by the push rod 49 connected therewith.

Since the unwinding positions of packages supported in the creel may be arranged much more closely than in conventional creels, a lower tier of unwinding positions may be aligned along a much higher level than the lower tier in conventional creels. Thus, the operators may work from a substantially standing or sitting position rather than a kneeling position to load the package holders of the lowermost tier. Moreover, the number of

tiers or levels of unwinding positions may be reduced and the uppermost tier arranged at a lower level than that normally provided to avoid the necessity for the operator to load holders in positions disposed overhead at an uncomfortably high level. The concentration of unwinding positions is greatly increased within the creel of the present invention by separating the unwinding stations of the same level by the baffles 46 to prevent the engagement of the ballooned yarns being unwound from adjacent positions. In spite of the compact structure of the creel herein disclosed, lacing of the creel is easily accomplished through the operation of the injector-type self-lacing tension devices 20. The loading of package holders is greatly facilitated by the telescoping structure of the horizontal standards which permit the movement of the package support 12 into the aisle, normally maintained adjacent a creel. The operator has ample room in which to handle and install packages on one holder of a support although the strand continues to be withdrawn from the other holder of such a support. As hereinabove suggested, the creel may be constructed in accordance with the present invention to effect greater utilization of space and/or to greatly add to the comfort and convenience in operating such a creel.

While a preferred embodiment of the invention has been shown and described, it is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claim.

I claim:

A creel comprising an upright frame, a plurality of standards extending laterally from the frame, each standard comprising a plurality of sections in telescopic relationship, an elongate support mounted between its ends for rotation about a vertical axis on the section of each standard having the greatest movement toward and away from the frame, a pair of package holders mounted on portions of the support disposed approximately equidistantly in opposite directions from the vertical axis, each holder having an upwardly extending axis about which the strand package may be concentrically supported, said supports being similar and the normal operating position of each support and the holders thereon being such that the length of the support extends lengthwise of the standard which supports it with the standard being fully retracted, the adjacent standards of the same level being approximately parallel and spaced to provide a clearance between adjacent assemblies of the supports, holders, and strand packages supported by adjacent standards but such standards being spaced at a distance less than the outermost diameter of rotation of the supports, a vertical baffle extending through the clearance between each pair of adjacent standards for preventing overlapping relationship of the paths of the strands being withdrawn from packages supported on adjacent standards, each standard being extendable to position the supports and the holders mounted thereon for rotation about the vertical axis in the clear of other portions of the creel.

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