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STRAND DISTRIBUTOR FOR SPOOLS OF DIFFERENT LENGTHS

Filed March 11, 1963

2 Sheets-Sheet 1

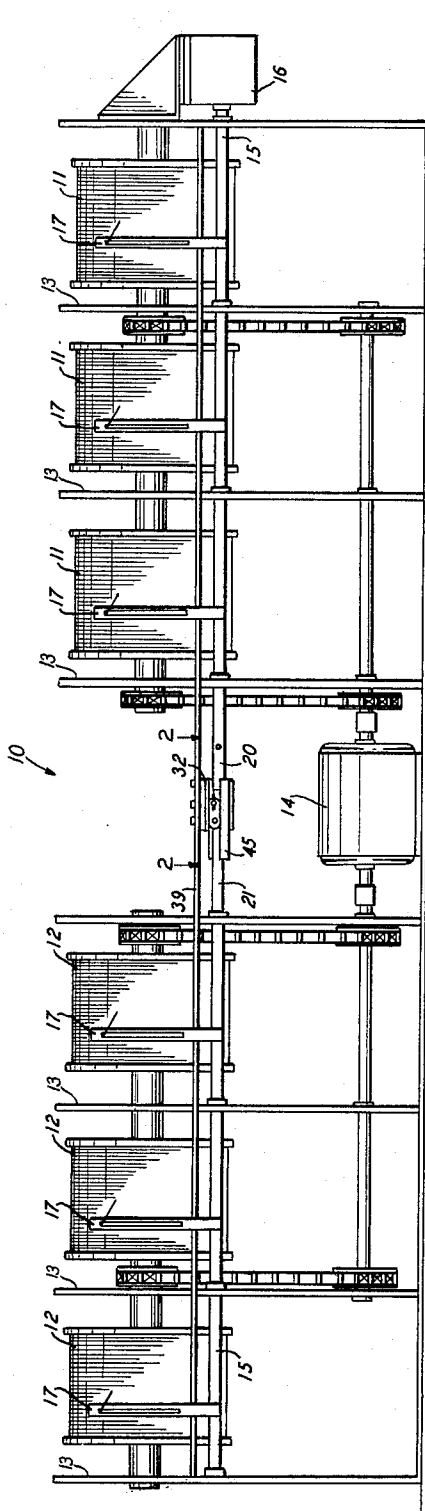


FIG. 1

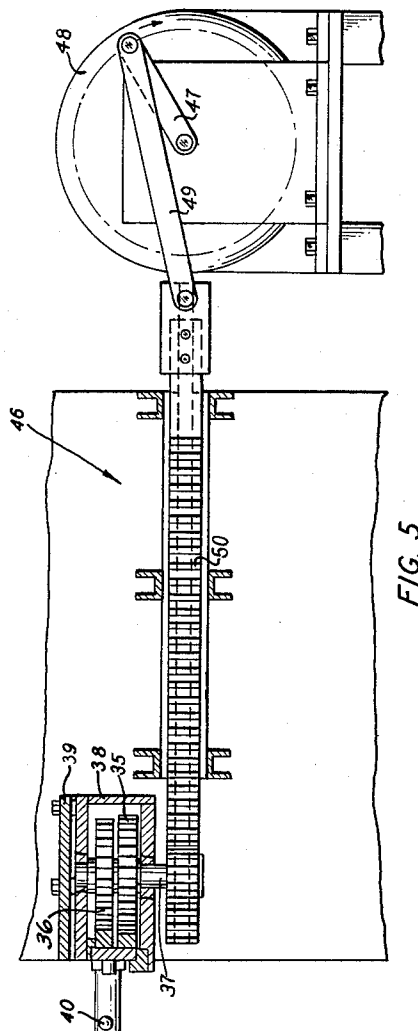


FIG. 5

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2 Sheets-Sheet 2

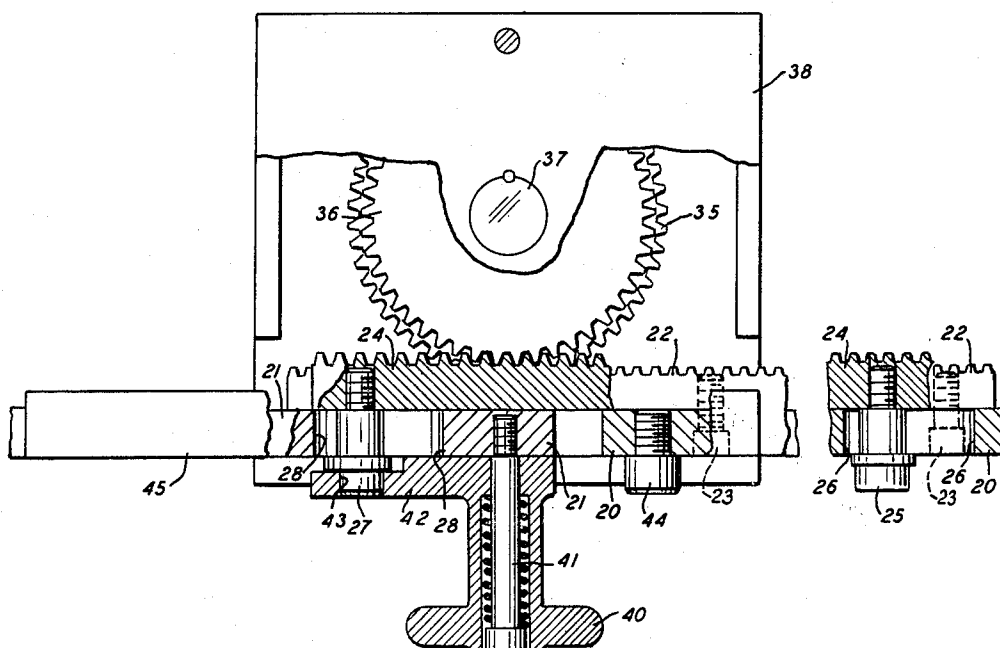


FIG. 2

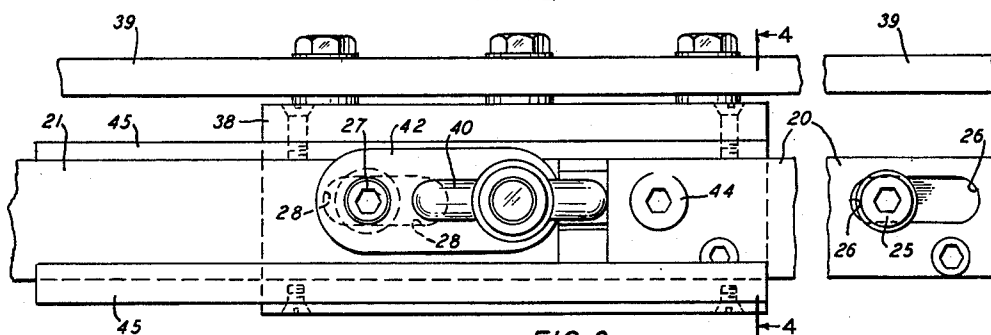


FIG. 3

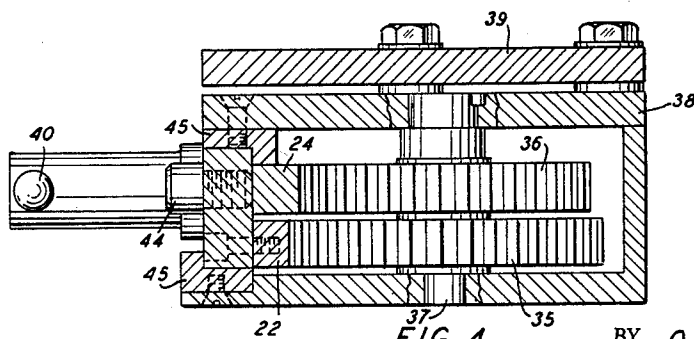


FIG. 4

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STRAND DISTRIBUTOR FOR SPOOLS OF DIFFERENT LENGTHS

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5 Claims. (Cl. 242-158)

This invention relates to a device for distributing a strand on a spool and particularly to a device for distributing strands on a plurality of spools where a single distributing bar is used.

It is customary in the prior art to mount a plurality of spools in a side-by-side relationship for rotation on a common axis and to oscillate parallel to the common axis a single distributing bar which carries a separate strand guide for each spool so as to guide a strand onto each individual spool. Difficulty is experienced where it is desirable or necessary to use spools of different lengths. Where spools of different lengths are utilized, it is not possible with prior art devices to compensate for the differences in length of various spools so as to properly distribute the strands on each spool.

It is, therefore, the object of this invention to provide facilities for oscillating different sections of a distributing bar at different speeds so as to compensate for spools of different lengths, whereby a strand will be properly distributed on each individual spool.

It is a further object of this invention to provide facilities for selectively oscillating a section of a distributor bar either at a different rate than other sections of the distributor bar or at the same rate.

With these and other objects in view, the present invention contemplates a strand distributor for a plurality of spools rotating about a common axis with a single distributing bar oscillating longitudinally to the axis of the spools wherein facilities are provided for varying the relative speed at which different sections of the distributing bar oscillate in accordance with the lengths of the corresponding spools.

Other objects and advantages of the present invention will be apparent from the following detailed description when considered in conjunction with the accompanying drawings, wherein:

FIG. 1 is a front view of a device utilizing the principles of the invention;

FIG. 2 is a partially cut away sectional view of FIG. 1 taken along lines 2-2;

FIG. 3 is a bottom view of FIG. 2;

FIG. 4 is a sectional view of FIG. 3 taken along lines 4-4; and

FIG. 5 is a view similar to FIG. 4 showing an alternate embodiment.

Referring to FIG. 1, a strand distributing apparatus is generally indicated by the numeral 10. The spools 11 and 12 are retained in the bins 13 and are there rotated about a common axis by a driving motor 14.

Distributor bar 15 is oscillated along the longitudinal axis of the spools by driver 16 through any conventional motor and gearing arrangement, such as that shown, for example, in FIG. 5. Strand guides 17 are carried by the distributor bar 15 so as to distribute the strands 18 on their respective spools 11 and 12 as the distributor bar 15 is oscillated.

Referring now to FIG. 2, the particulars of the appara-

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tus for varying the speeds at which various sections of the distributor bar 15 oscillate are set forth in detail. The distributor bar 15 is divided into two sections, a driving section 20 and a driven section 21. It is, of course, possible to divide the bar into any desired number of sections so as to oscillate each section at any desired relative speed. Driving section 20 is oscillated directly by the driver 16. Rack 22 is mounted rigidly to section 20, for example, by bolts 23. Floating rack 24 is attached to section 20 and to section 21 by pin and slot arrangements, the pin 25 retaining one end of rack 24 in the slot 26 of section 20 and the pin 27 retaining the other end of rack 24 in the slot 28 of section 21.

The rack 24 is oscillated directly by the driving section 22, being attached rigidly thereto. Pinion gears 35 and 36 are mounted on a freely rotating shaft 37. The shaft 37 is carried by the housing 38, which housing is rigidly attached to a guide 39 of the strand distributor 10.

The rack 22 rotates the pinion 35 as the rack is oscillated by the driving section 20. The pinion 35 then rotates the shaft 37 which in turn rotates the pinion 36. The pinion 36 then oscillates the floating rack 24. The speed at which the floating rack oscillates relative to the driving section 20 depends on the gear ratio between pinions 35 and 36. Obviously, the floating rack 24 can oscillate either faster or slower than the driving section 20.

The driven section 21 can either oscillate with the floating rack 24 or with the driving section 20 by selectively attaching the driven section 21 to one or the other. Further, if section 21 when attached to the floating rack 24 moves at a faster rate of speed in each direction than section 20, the strand guides 17 carried by section 21 will traverse a longer distance than the strand guides carried by section 20. On the other hand, if section 21 moves at a slower speed in each direction than section 20, the strand guides 17 carried by section 21 will traverse a shorter distance than the strand guides carried by section 20. As shown in FIG. 2, the section 21 oscillates at a slower speed than section 20, the spools 12 being shorter than spools 11.

A handle 40 is provided for selectively attaching the driven section 21 to either the floating rack 24 or to the driving section 20. The handle 40 is rotatably mounted on section 21 by shaft 41 and is provided with a tongue 42 which has an aperture 43 therein. As seen in FIG. 2, the handle 40 may be positioned so that aperture 43 will receive the head of pin 27. In this position, the pin 27 will be restrained from movement within slot 28. This, in effect, rigidly attaches the driven section 21 to floating rack 24. Therefore, section 21 will oscillate with the floating rack 24.

The handle 40 is spring biased so as to retain the tongue 42 against the section 21. By pulling the handle 42, pin 27 will be freed from aperture 43. A 180° rotation of the handle 40 brings aperture 43 into position over pin 44. Pin 44 is rigidly attached to the driving section 20.

Therefore, by permitting the aperture 43 to receive the head of the pin 44, the section 21 will be rigidly attached to section 20 so as to oscillate therewith. In this position, the floating rack 24 will oscillate freely in the slot 28 of section 21 and slot 26 of section 20.

As more clearly seen in FIGS. 3 and 4, a guide 45 carried by the housing 38 is provided for supporting and guiding the ends of the sections 20 and 21 of the distributor bar 15.

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Spools of different lengths may be accommodated by varying the ratio between the gears. It is considered obvious that any number of such sections may be utilized and may be oscillated at any desired speed merely by the appropriate choice of gear ratios. In the disclosed embodiment and only by way of example, the section 21 may be selectively oscillated at a slower speed than section 20 so that spools having a length of, for example, $4\frac{3}{4}$ inches, will be fed from the section 20; and spools having a shorter length, for example, $4\frac{1}{8}$ inches, will be fed from section 21.

Where it is desirable to use spools all of the same length, it is then only necessary to make a quick adjustment with handle 40 so as to join the sections of the distributor bar 15 together so that all of the strand guides 17 will oscillate at the same speed.

An alternate embodiment, as seen in FIG. 5, for oscillating the sections 20 and 21 at different speeds is to drive the shaft 37 directly by a conventional driving arrangement such as generally indicated by the numeral 46. In this embodiment sections 20 and 21 will be oscillated at the same speed by pinion 35 driving rack 22 when the sections 20 and 21 are joined together. When section 21 is attached to floating rack 24, pinion 36 will oscillate section 21, while pinion 35 will oscillate section 20. In this manner the relative speeds at which sections 20 and 21 oscillate can be controlled so as to compensate for spools of different lengths.

The driving means 46 oscillates the pinions 35 and 36 by oscillating the shaft 37. A linkage 47 is attached to the shaft of motor 48 for rotation therewith. Linkage 49 connects one end of rack 50 to the linkage 47 so that upon the shaft of motor 48 being rotated, the linkage 49 is rotated to oscillate rack 50 back and forth so as to oscillate the shaft 37.

It is to be understood that the above-described arrangement of apparatus and construction of elemental parts are simply illustrative of an application of the principles of the invention and many other modifications may be made without departing therefrom. For example, the principles of the present invention could be utilized to distribute coils of different lengths on a single core without the necessity of providing separate spools.

What is claimed is:

1. A device for selectively oscillating different sections of a distributor bar at different speeds to distribute strands on a plurality of spools mounted on a common axis, said device comprising:

- a distributor bar having at least a first and second section each section carrying a plurality of strand guides so as to distribute a strand on each of said spools upon oscillation of said distributor bar,
- a rack rigidly mounted on said first section,
- a floating rack,
- means for oscillating the rack mounted on the first section and for oscillating the floating rack at different rates of speed, and
- means for selectively connecting the second section to either the floating rack or to the first section.

2. A device for selectively oscillating different sections of a distributor bar at different speeds to distribute strands on a plurality of spools mounted on a common axis, said device comprising:

- a distributor bar having at least a first and second section each section carrying a plurality of strand guides so as to distribute a strand on each of said spools upon oscillation of said distributor bar,
- a rack rigidly mounted on said first section,
- a shaft mounted for rotation about its longitudinal axis,
- a first pinion mounted on said shaft and engaging said rack so as to displace said first section upon rotation of said shaft,
- a floating rack mounted for reciprocative movement in the device,

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a second pinion mounted on said shaft and meshing with said floating rack so as to displace said floating rack upon rotation of said shaft, said first and second pinions having relatively different pitches so that the velocity of displacement of said floating rack is different than the velocity of displacement of said first section,

means for oscillating said shaft so as to oscillate said first section and said floating rack at different relative speeds, and

means for selectively connecting the second section to either the floating rack or to the first section.

3. A device for distributing strands on spools, comprising:

- a plurality of spools mounted for rotation in side-by-side relationship about a common axis,
- a distributor bar having separate strand guides for each spool so that upon oscillation of the distributor bar a strand will be distributed on each spool, said bar being divided into at least two sections,
- a driver for oscillating the first section of the distributor bar,
- a driving rack engaged rigidly to the first section of the distributor bar,
- a floating rack, movable in the device,
- a first and second pinion having different pitches and mounted rigidly on a common shaft which shaft is freely rotatable, said first pinion being rotated by said driving rack and said second pinion driving said floating rack, the speed at which the floating rack oscillates relative to the driving rack being a function of the ratio between the pitches of the pinions, and
- means for selectively locking the sections together to cause both sections to oscillate together or for locking the second section to the floating rack so as to oscillate the second section at a different rate of speed relative to the first section so that the strands will be properly distributed on spools of different lengths.

4. A device for distributing a strand on spools of different lengths, comprising:

- a plurality of spools mounted for rotation on a common axis,
- a distributor bar having a first and second section,
- means for oscillating the first section of the distributor bar,
- a first rack mounted rigidly to said first section,
- a floating rack mounted for reciprocative movement in the device,
- means for selectively fixing said floating rack rigidly to said second section,
- a freely rotatable, double pinion meshing with said first and said floating rack, said double pinion being driven by movement of said first rack and being so constructed as to oscillate said floating rack at a different velocity than said first rack, and
- means for rigidly connecting said first and second section of said distributor bar when said floating rack is released from its rigid attachment to said second section.

5. A device for selectively oscillating a second section of a distributor bar at a different speed relative to a first section of the distributor bar wherein a plurality of spools are mounted for rotation on a common axis, said distributor bar having a plurality of strand guides for guiding a strand on each spool as said distributor bar is oscillated, said first section of said distributor bar distributing strands on spools of a different length than said second section, said device comprising:

- a driving rack rigidly mounted on said first section,
- means for oscillating said first section of the distributor bar,
- a floating rack mounted for movement in said device,
- a shaft fixedly connecting a first and second pinion for

rotation about an axis perpendicular to the direction of rack movement, said first pinion meshing with said driving rack so as to be driven thereby, said second pinion meshing with said floating rack and constructed so as to drive said floating rack at a velocity different from that of said driving rack, and means for selectively decoupling said floating rack from said second section and coupling said first and said second sections together.

1,926,081
2,026,459
2,859,630

5

365,228
712,297

References Cited in the file of this patent

UNITED STATES PATENTS

Brenzinger	Sept. 12, 1933
Caretta	Dec. 31, 1935
Hatch	Nov. 11, 1958

FOREIGN PATENTS

France	June 20, 1906
France	July 20, 1931