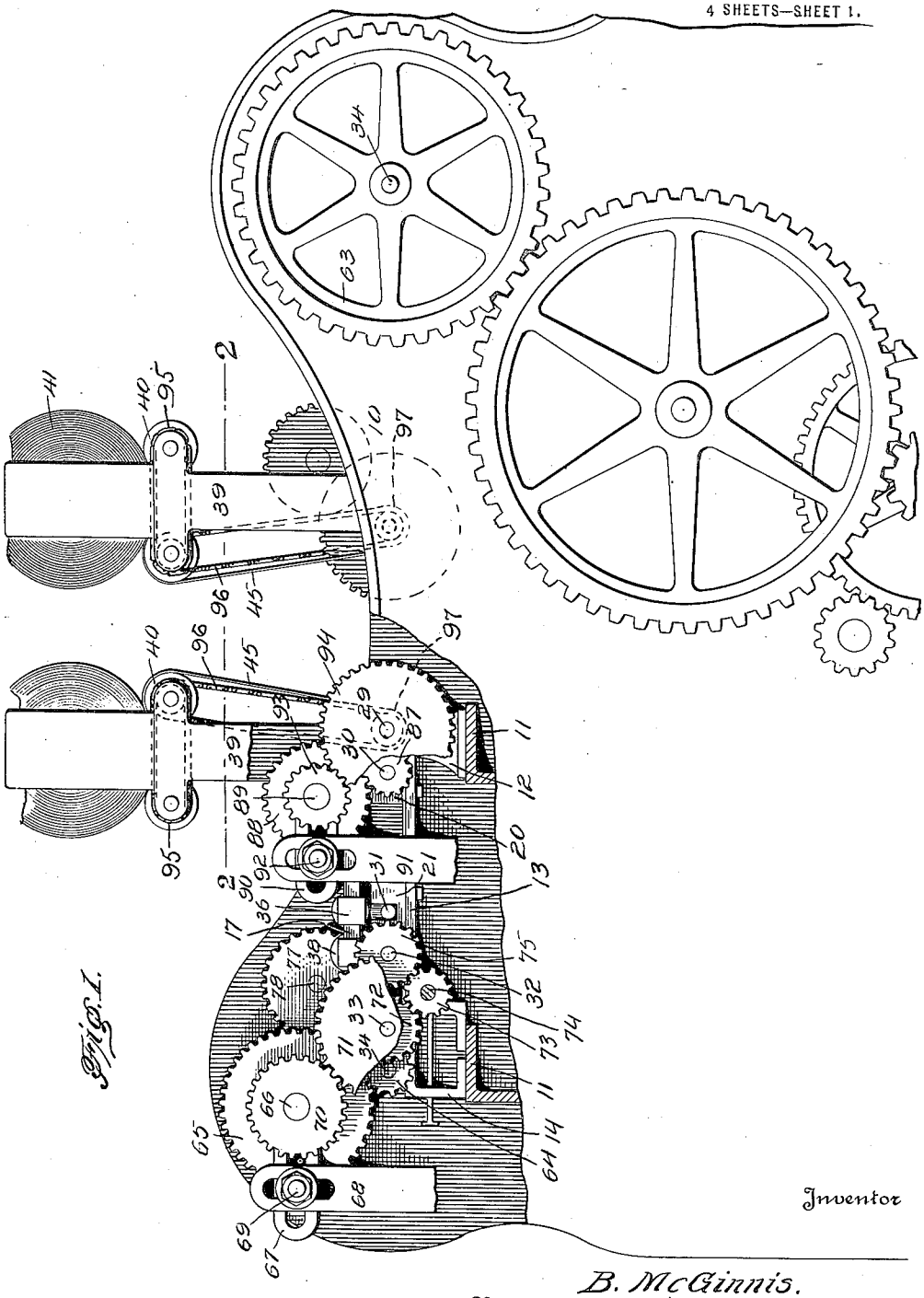
B. McGINNIS.

DRAWING AND SPINNING APPARATUS.

APPLICATION FILED APR. 16, 1921.

1,407,555. Patented Feb. 21, 1922.

4 SHEETS—SHEET 1.



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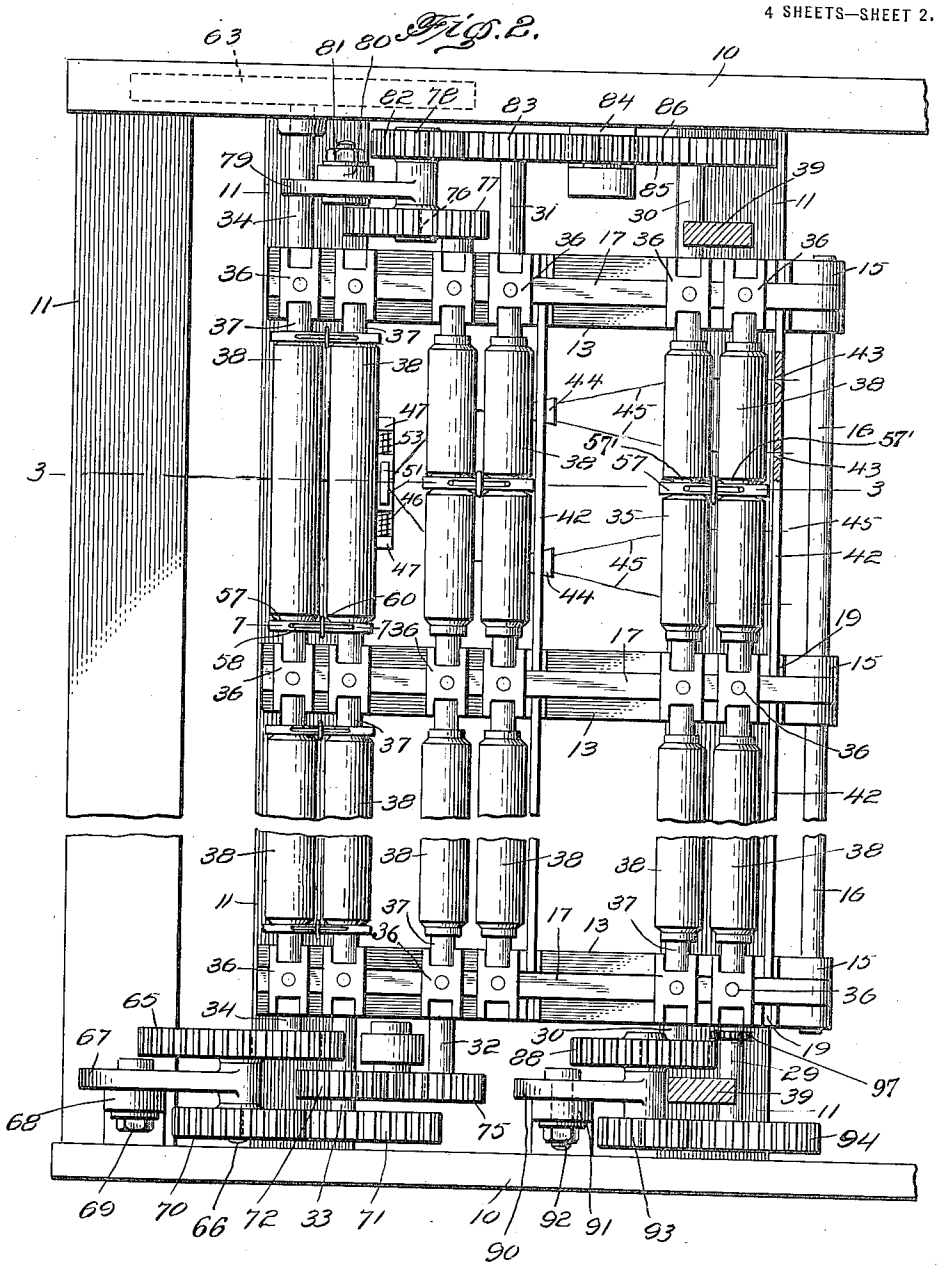
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

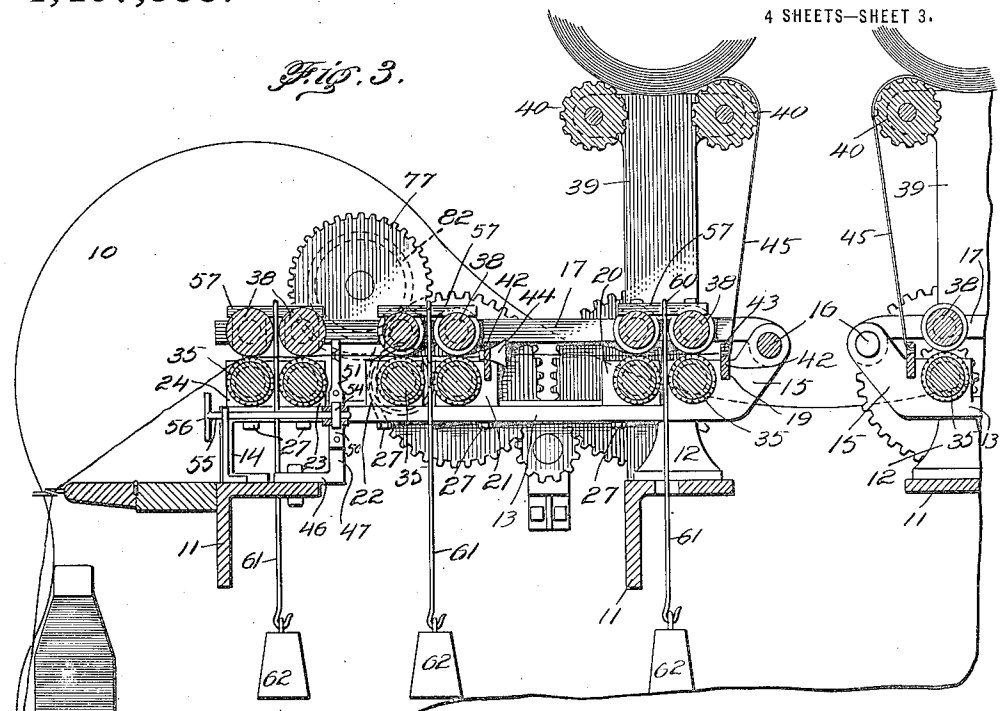


Fig. 5.

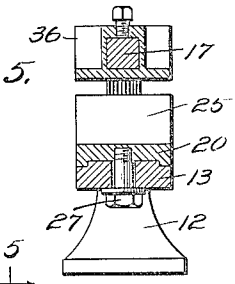


Fig. 6.

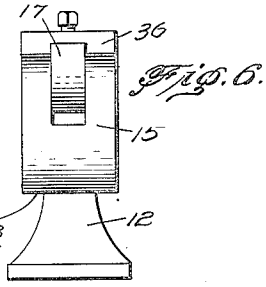
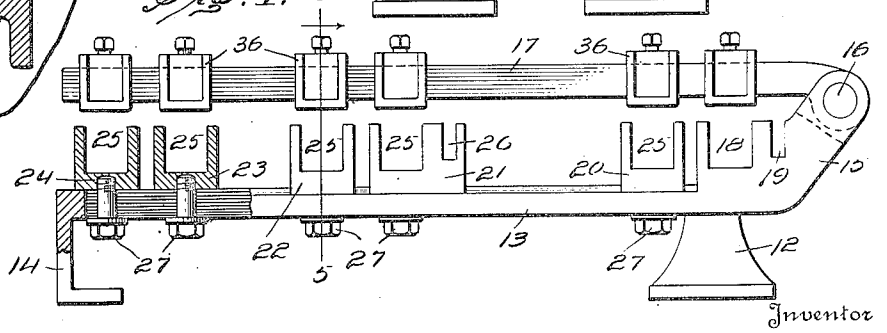


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 7.

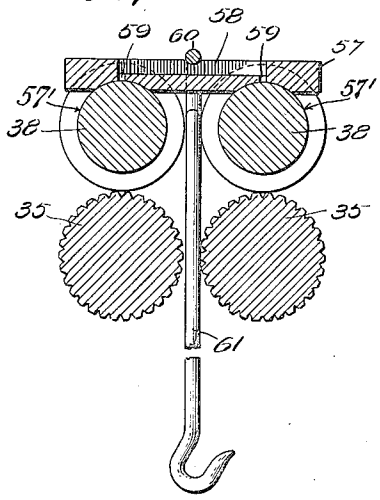


Fig. 8.

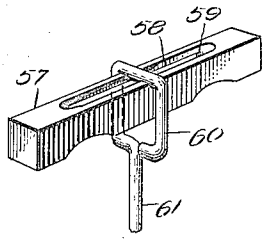


Fig. 10.

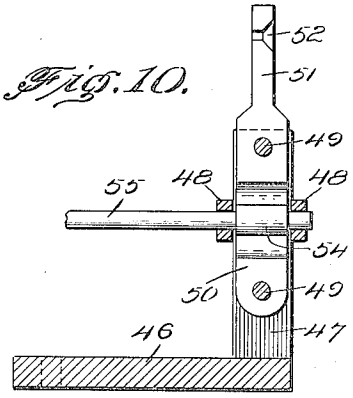
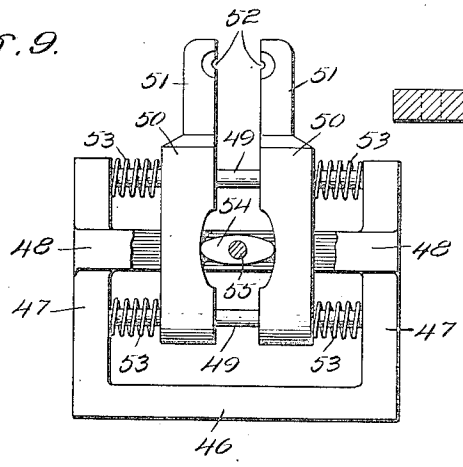


Fig. 9.



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UNITED STATES PATENT OFFICE.

BALDY McGINNIS, OF MARSHALL, NORTH CAROLINA.

DRAWING AND SPINNING APPARATUS.

1,407,555. Specification of Letters Patent. Patented Feb. 21, 1922.

Application filed April 16, 1921. Serial No. 461,996.

To all whom it may concern:

Be it known that I, BALDY McGINNIS, a citizen of the United States, residing at Marshall, in the county of Madison and State of North Carolina, have invented certain new and useful Improvements in a Drawing and Spinning Apparatus, of which the following is a specification.

This invention relates to drawing and spinning apparatus, and has for one of its objects to simplify and improve the construction and increase the efficiency and utility of devices of this character.

In the manufacture of yarns as usually conducted, a series of machines is employed prior to the winding on bobbins, these machines being generally widely spaced, and the principal object of the present invention is to construct a single machine adapted to perform all of the operations of the previously separate machines, thus materially reducing the expense of manufacture and correspondingly reducing the time required to accomplish the desired results.

Another object of this invention is to provide a device of this character including a plurality of series of drawing rolls in groups of twos running at differential speeds and comprising an intake or initial group arranged to receive rovings from a plurality of lap rolls, an intermediate group to concentrate and an outtake or discharge group to receive the rovings from the intermediate group and adapted to conduct them to winding bobbins or the like.

Another object of the invention is to provide an apparatus of this character in which the number of parts or devices required to produce the desired results are materially reduced.

Another object of the invention is to produce a device of this character having novel means for producing the requisite difference in speeds of a plurality of drawing rollers.

Another object of the invention is to produce an apparatus of this character having a novel guiding device for the rovings as they pass to the drawing rolls.

In the drawings illustrative of the preferred embodiment of the invention:

Figure 1 is a side elevation, partly in section, of the improved apparatus.

Fig. 2 is a plan view of portions of the parts shown in Fig. 1, with the supports for one set of the lap rolls in transverse section on the line 2—2 of Fig. 1.

Fig. 3 is a longitudinal sectional elevation, the section being taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged side elevation, partly in section, of one of the roll supporting frames.

Fig. 5 is a transverse section on the line 5—5 of Fig. 4.

Fig. 6 is an end elevation of the parts shown in Fig. 4.

Fig. 7 is an enlarged section on the line 7—7 of Fig. 2.

Fig. 8 is an enlarged detached perspective view of one of the combined roll tension and oil conducting devices.

Fig. 9 is an enlarged detail of one of the guides for the roving as it passes to the last set of rolls.

Fig. 10 is a side elevation partly in section of the parts shown in Fig. 9.

The improved apparatus includes a supporting frame work formed of spaced longitudinal side members 10 and transverse connecting members 11.

The frame members may be of any required size or material, and arranged to support any required number of the sets of rolls, but for the purpose of illustration one full set and a part of another set are shown, but it will not constitute a departure from the principle of the invention.

The transverse frame members are arranged in pairs, and mounted upon one member of each pair are a plurality of standards 12, each standard supporting a bar 13 rigidly connected thereto near one end. Each of the bars 13 is supported at its opposite end by a depending portion 14 mounted on another of the transverse members as shown.

Each bar 13 is also extended upwardly at the end next to the standard 12 as shown at 15, and pivoted at 16 to each extension 15 is another bar 17 directed substantially in parallel relation to the bar 13. The pivots 16 are in the form of a continuous rod, as shown.

Next to the extension 15 each of the bars 13 is formed with a socket 18 and a smaller seat 19, and adjustably supported upon each of the bars 13 are brackets 20—21—22—23 and 24. The brackets 20—22—23 and 24 are each formed with a single socket 25, while each of the brackets 21 is provided with a socket 25 and a smaller seat 26 similar to the seat 19. The brackets 20, 21, 22,

23, and 24 are coupled to the bar 13 in any suitable manner, for instance by cap screws 27.

It will be understood that a set of the brackets 20—21—22—23 and 24 is supported upon each of the bars 13, each of the sockets 25 and the socket 18 being provided with a bearing block to respectively receive continuous shafts 29—30—31—32—33—34.

For the purpose of illustration three sets of the bars 13 and 17 are shown, thus supporting two series of the drawing rolls, and their associated parts, but it will be understood that the continuous shafts may be of any required length to support a corresponding series of the rolls.

The bracket 20 is located relatively near the socket 18, while the brackets 21 and 22 are disposed relatively near each other, while the brackets 23 and 24 are likewise located relatively near each other, so that the continuous shafts are supported in pairs, as shown.

Formed upon or attached to each of the continuous shafts and between the bars 13, is a fluted roll 35, the rolls operating in pairs as shown more clearly in Fig. 3, with their confronting faces in spaced relation.

Supported upon each of the upper and adjustable bars 17 are a series of bearing blocks 36 one for each of the brackets on the bars 13, and each formed with a seat to receive the journals 37 of the upper rolls, designated conventionally at 38.

The lower fluted rolls 35 are of metal, preferably steel, while the upper rolls are covered with leather or the like, in the usual manner.

The seats for the journals 37 in the bearing blocks are formed with spaced vertical sides, so that the journals 37 of the upper rolls are freely movable vertically.

Rising from the transverse frame member 11 nearest to the pivot rod 16 are standards 39 having ribbed supporting rolls 40 in spaced relation to frictionally support the "laps" arranged in loosely wound rolls, as represented at 41. The seats 19 and 26 support guide devices 42.

The journals of the ribbed supporting rollers 40 are provided with chain pulleys to receive an endless chain 95, while one of the journals of one of the ribbed rollers is provided with another chain pulley to receive an endless chain 96 leading over a small chain pulley 97 on one of the journals of one of the rollers 38 at the intake side. By this means motion is imparted to the ribbed rollers from the feed rollers and at the same speed.

For the purpose of this description the side of the apparatus at the right is referred to as the intake side and the opposite as the outlet or finishing side.

The member 42 at the intake side is provided with four apertures 43 for the passage of the rovings from four of the "laps", while the other or inner member 42 is provided with two of the guide apertures, preferably with small guide trumpets 44.

By this means the four rovings, indicated at 45, are conducted from the rolls 41 which rest on the rollers 40, and pass thence between the first series of the rolls, and then two of the rovings combined and passed through one of the "trumpets" 44, and the other two combined and passed through the other "trumpet".

Supported upon the transverse frame member 11 at the outlet side are supporting brackets, one of which is shown in Figs. 9 and 10, each comprising a base portion 46 vertical portions 47 and spaced horizontal portions 48 connecting the vertical members 47.

Extending between the vertical members 47 above and below the lines of the spaced members 48 are guide rods 49, and slidable on the rods and extending between the spaced members 48 are guide members 50 each with an upwardly directed portion 51 having half guide grooves 52. The members 50 are held normally and yieldably in face contact by springs 53, and are adapted to be distended by a cam device 54 on a shaft 55, the cam operating in pockets in the confronting faces of the members 50, as shown in Fig. 9.

By this arrangement when the cam device is disposed with its larger axis transversely of the members 50 the latter will be separated to permit the insertion of the four strands of the material, and then when the cam device is disposed with its longer axis in vertical position, the springs 53 will close the members 50 and form a closed or continuous aperture through the closed half apertures 52, and effectually guide the four rovings as one to the outlet sets of rolls, as shown in Fig. 2.

When the cam device 54 is disposed with its longer axis in vertical position it will be received in the pockets in the members 50 and become noneffective.

A turning wheel 56 is attached to the shaft 55 to enable the latter to be operated.

All of the rollers are provided with journals at their ends to engage in bearing blocks which fit in the sockets 25 and 36, while the upper forward and intermediate rollers 38 are also provided with intermediate journals indicated at 57′ in Figs. 1 and 7.

Bearing over each pair of the journals 57′, of the upper rolls 38 at the intake side of the apparatus are tension members 57 and likewise over each pair of the journals 57′ of the intermediate rolls is a like tension member 57, illustrated more fully in Figs. 7 and 8. Each pair of the upper rolls at the outlet side is provided with two of

the tension members 57 at the ends of the rolls, as shown in Fig. 2.

Each of the members 57 has a recess or cavity 58 in its upper face to receive a lubricant, and with feed orifices 59 at the ends to permit the lubricant to flow to the journal portions.

Suspended from each of the tension members 57 by an eye 60 is a tension rod 61 having a weight 62 attached to its lower end.

By this means the requisite tension is applied to the upper rolls to cause them to bear with the necessary pressure upon the roving material passing between the rolls.

In Fig. 3 a conventional bobbin structure is shown upon which the roving after passing the outlet series of rolls is automatically wound, this mechanism being omitted from Fig. 2 as it forms no part of the present invention.

The gearing for operating the shafts 29 to 34 is illustrated in Figs. 1—2 and 3, and is so arranged that the second rolls 35 from the intake side run faster than the first rolls, while the third rolls run at the same speed as the second roll. The fourth rolls run faster than the third roll, while the fifth rolls run at the same speed as the fourth rolls. The sixth rolls run faster than the fifth rolls.

By this means a slight pulling action is produced on the roving as it passes from the first to the second rolls, no pulling action produced while passing from the second to the third rolls, a slight pulling action produced while passing from the third to the fourth rolls, no pulling action produced while passing from the fourth to the fifth rolls, and a slight pulling action produced while passing from the fifth to the sixth rolls. By this means the rovings are attenuated and all four united into a single roving or "sliver" as it passes to the bobbin devices.

The motion for the various rolls is first imparted to the shaft 34 within the overhang of one of the frame members 10, as indicated by dotted lines at 63 in Fig. 2, and transmitted thence by a small gear 64 to a larger gear 65 on a stub shaft 66, carried by a slotted arm 67. Attached to the inner face of the adjacent frame member 10 is a slotted bracket 68, with a clamp bolt 69 operating through the slots of the members 67 and 68. By this means the stub shaft may be adjusted both vertically and horizontally.

Mounted on the same stub shaft 66 is a smaller gear 70 which engages a larger gear 71 on the shaft 33, and mounted on the same shaft 33 is a smaller gear 72 engaging a smaller idler gear 73 on a stub shaft 74 which in turn engages a gear 75 on the shaft 32.

By this arrangement the shaft 34 carrying the sixth fluted rolls is rotated at a higher speed than the shaft 33 carrying the fourth fluted rolls and producing the requisite drawing action on the roving, while the shaft 32 is rotated at the same speed as the shaft 33, so that no drawing action is produced upon the roving passing from the fluted rolls 35 of the shaft 32 to the fluted rolls of the shaft 33.

Mounted on the shaft 32 at the opposite end, is a relatively small gear indicated at 76 and engaging a larger gear 77 on a stub shaft 78, the latter in turn supported in a slotted arm 79 similar to the arm 67.

Attached to the inner face of the adjacent frame member 10 is a slotted bracket 80 similar to the bracket 68, the slots adapted to receive a clamp bolt 81 similar to the clamp bolt 69.

Mounted on the stub shaft 78 is another and smaller gear 82 engaging with a slightly larger gear 83 on the shaft 31. By this means motion is transmitted from the shaft 32 to the shaft 31 but at a reduced speed.

Mounted on a stub shaft indicated at 84 is a relatively small gear 85 engaging with a gear 86 on the shaft 30, of the same size as the gear 83, so that the motion of the shaft 31 will be transmitted to the shaft 30 at the same speed. Thus there will be no drawing action on the roving as it is passed from the rolls 35 of the shaft 30 to the like rolls of the shaft 31.

Mounted on the shaft 30 at the opposite end is a relatively small gear 87 engaging with a larger gear 88 on a stub shaft 89, the latter in turn carried by a slotted arm 90.

Attached to the inner face of the adjacent frame member 10 is a slotted bracket 91 with a clamp bolt 92 operating through the slots of the members 90 and 91 to enable the gears carried by the arm 90 to be adjusted as required.

Mounted on the stub shaft 89 is a relatively small gear 93 engaging with a larger gear 94 on the shaft 29.

My this means the motion of the shaft 30 will be transmitted to the shaft 29 at an increased speed, so that a drawing action will be exerted on the rovings passing from the rolls on the shaft 29 to the rolls on the shaft 30.

At the right of Fig. 1, is shown the arrangement of the gearing whereby the necessary motion is imparted to the initial shaft 34, but as this gearing forms no part of the present invention it is not deemed necessary to further describe it, it being understood that a corresponding system of gears is arranged at the opposite side of the apparatus.

In Figs. 1 and 3 one full system of the rolls and attachments are shown at the left, and portions of a duplicate system at the right, the two systems being alike except that they are arranged in reverse order.

By this arrangement the entire operation

of preparing the "yarn" for the finishing operation of the ring spinning machine is accomplished in one single machine, and the necessity for a separate series of machines obviated.

The preferred embodiment of the invention is disclosed in the drawings as set forth in the specifications, but it will be understood that any modifications within the scope of the claims may be made in the construction without departing from the principle of the invention or sacrificing any of its advantages.

What I claim is:—

1. A device of the class described comprising coacting members having half guide recesses in their confronting faces adapted to receive a plurality of rovings and concentrate them into a single roving on their passage through the guide recesses, means for yieldably holding said members in face contact, and means for separating said members against the resistance of said yieldable holding means to provide an unobstructed opening into which the rovings can be inserted from above when the members are separated.

2. In an apparatus of the class described, including groups of drawing rolls in spaced relation, coacting members between said groups of drawing rolls and having half guide recesses in their confronting faces, means for yieldably holding said members in face contact, and means for separating said members against the resistance of said yieldable holding means, to provide an unobstructed opening into which the rovings can be inserted from above when the members are separated.

3. In an apparatus of the class described, including groups of drawing rolls, coacting members having half guide recesses in their confronting faces adapted to receive a plurality of rovings and concentrate them into a single roving on their passage to the drawing rolls, means for yieldably holding said members in face contact, and means for separating said members against the resistance of said yieldable holding means, to provide an unobstructed opening into which the rovings can be inserted from above when the members are separated.

In testimony whereof, I affix my signature hereto.

BALDY McGINNIS.