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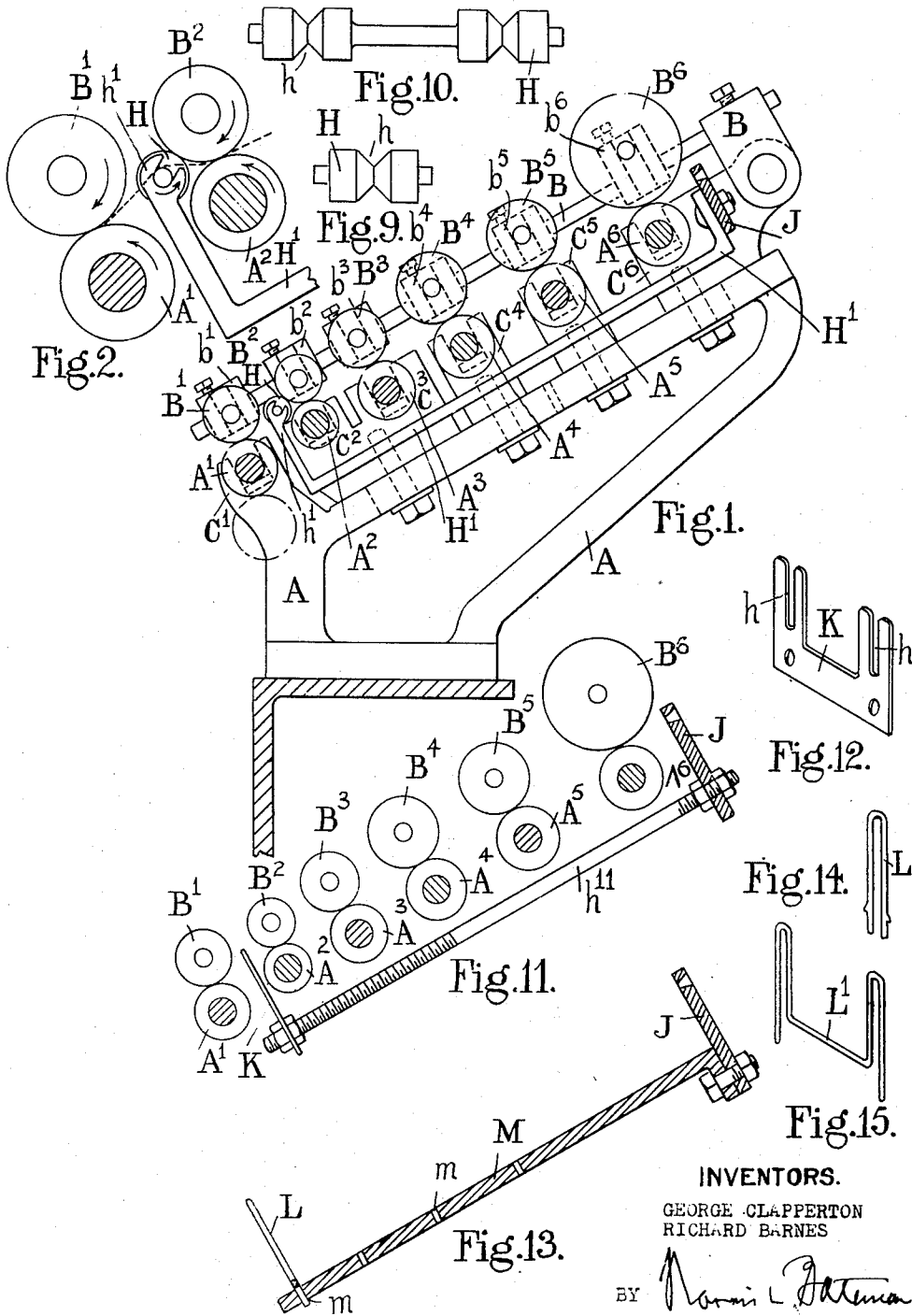
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2,335,108

DRAFTING HEAD OF TEXTILE MACHINERY

Filed Jan. 7, 1943

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

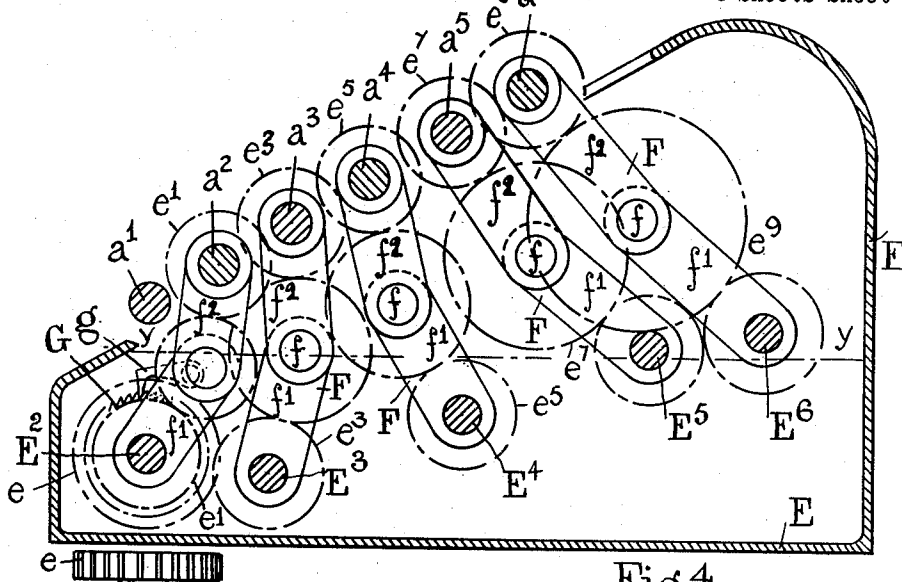


Fig. 4.

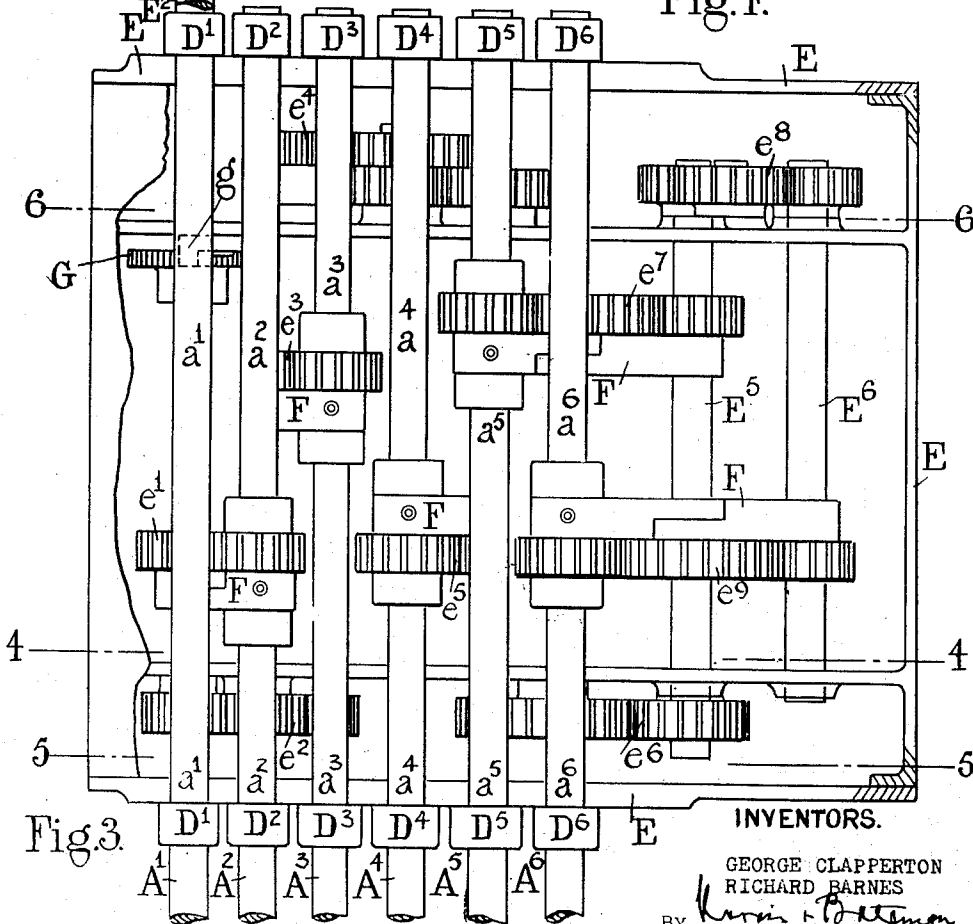


Fig. 3.

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4 Sheets-Sheet 3

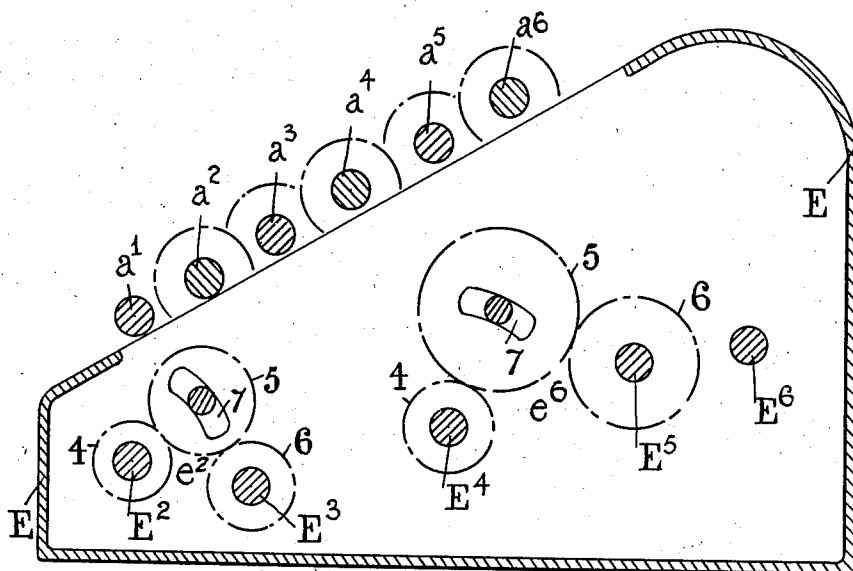


Fig. 5.

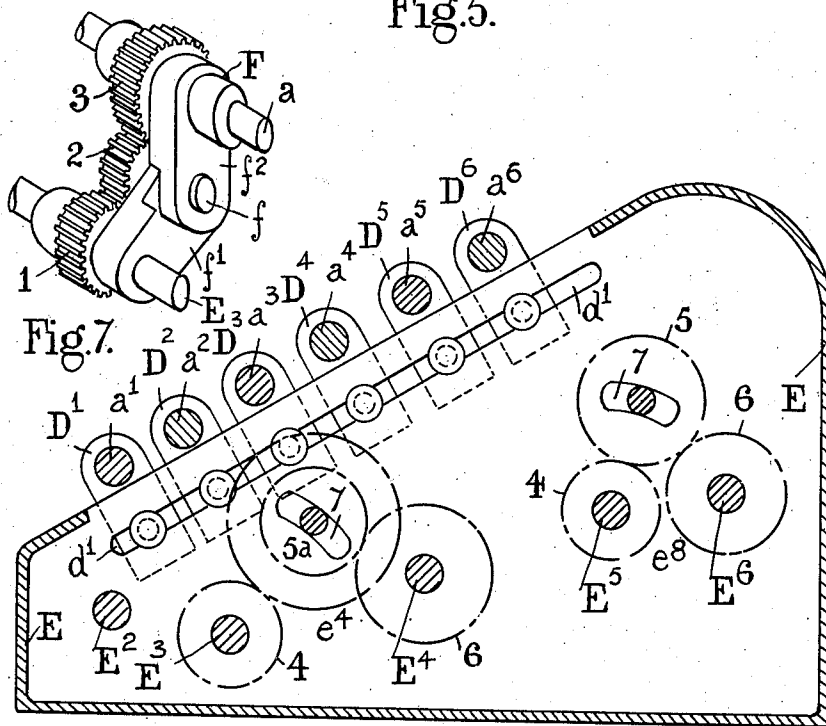


Fig. 6.

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4 Sheets-Sheet 4

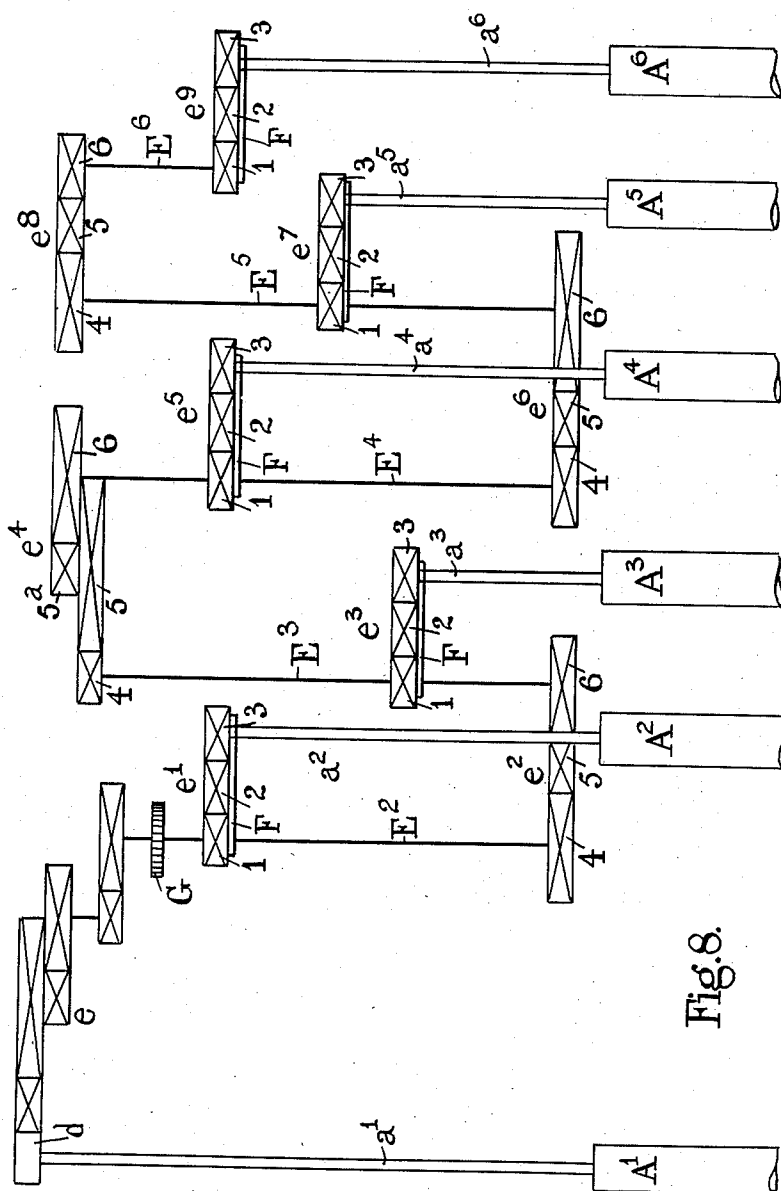


Fig. 8.

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UNITED STATES PATENT OFFICE

2,335,108

DRAFTING HEAD OF TEXTILE
MACHINERYGeorge Clapperton, Springfield, Green Lane, Bolton,
and Richard Barnes, Atherton, EnglandApplication January 7, 1943, Serial No. 471,636
In Great Britain January 29, 1942

3 Claims. (Cl. 19-130)

This invention relates to improvements in the drafting heads of textile machines.

Although the main object of the invention is the provision of a drafting head of a ring spinning frame which will obviate the necessity for using some or all of slubbing, intermediate, roving and/or jack frames, the head can also be applied to any drafting machine if desired.

The drafting head according to the invention consists of a number of pairs of top and bottom rollers, the bottom roller of each pair being driven, the speed of each successive roller from back to front being progressively increased though not necessarily in a constant ratio so that a substantially progressive drafting of the slivers is obtained as they pass through the head.

Each bottom roller shaft, other than the front bottom roller shaft, is driven from an independent short shaft supported in suitable bearings near the bottom of the gear box, each independent shaft being located with its axis to one or other side of a vertical plane through the axis of the corresponding roller shaft.

The invention is illustrated in and will be described with reference to the accompanying drawings. In these drawings:

Fig. 1 is a transverse section through a drawing head having six lines of rollers,

Fig. 2 is a similar section drawn to a larger scale of the front and second lines of rollers,

Fig. 3 is a plan of the gear box with a portion of the top broken away,

Fig. 4 is a transverse section on line 4-4 Fig. 3,

Fig. 5 is a transverse section on line 5-5 Fig. 3,

Fig. 6 is a transverse section on line 6-6 Fig. 3,

Fig. 7 is a perspective view of a link carrying the gear wheels between a short driving shaft and the bottom roller shaft driven therefrom,

Fig. 8 is a diagrammatic view illustrating the arrangement of the shafts and gears. In this view the distances between the rollers are not intended to bear any relationship to the actual distances between the rollers nor are the gear ratios necessarily those which would be actually employed. The bottom roller shafts are each indicated in this view by double lines and the short driving shafts are each indicated by a single line,

Fig. 9 is a front view of a grooved roller adapted to be located between any pair of lines of rollers to consolidate the fibres of the slivers. In Figs. 1 and 2 this roller is shown between the front and second lines of rollers,

Fig. 10 is a front view of a pair of grooved

rollers similar to the roller shown in Fig. 9 adapted to serve a pair of adjacent slivers,

Fig. 11 is a transverse section through a head showing an alternative form of guide and supporting means therefor for consolidating the fibres,

Fig. 12 is a perspective view of the guide shown in Fig. 11,

Fig. 13 is a transverse section through a head (the rollers being omitted) showing means for supporting a still further form of guide for consolidating the fibres,

Fig. 14 is a perspective view of the guide shown in Fig. 13,

Fig. 15 is a perspective view of a guide similar to that shown in Fig. 14, but adapted to serve a pair of adjacent slivers.

In the embodiment of the invention illustrated in the drawings the drafting head consists of six lines of bottom rollers $A^1, A^2, A^3, A^4, A^5, A^6$, with corresponding top rollers $B^1, B^2, B^3, B^4, B^5, B^6$. The front bottom roller A^1 is journaled in a fixed bearing C^1 carried in the frame or stand A and the rollers A^2-A^6 are journaled in bearings C^2-C^6 slidably mounted in the stand or frame to permit of the distance between the nip of any of the pair of top and bottom rollers A^2, B^2-A^6, B^6 , and the nip of the front pair of rollers A^1, B^1 and also between any adjacent pairs of rollers being adjusted to suit the staples of any particular class of cotton being treated. As it is not usually necessary to adjust the relative positions of the rollers A^2, B^2 and A^3, B^3 , the bearings C^2 and C^3 of the rollers A^2 and A^3 are shown carried by a single slide but they could if desired be carried by separate slides.

The top rollers B^1-B^6 are supported in the usual way by bearings b^1-b^6 adjustably mounted on the cap bar B .

The shaft a^1 of the front bottom roller A^1 is driven in the usual way as indicated by the gear wheel d in Fig. 8 in synchronisation with the spindle drive and one end of this shaft projects over the top of a gear box E located at one end of the spinning frame or machine. The shafts a^2-a^6 of the other bottom rollers A^2-A^6 also project over the top of the gear box E as illustrated particularly in Fig. 3.

Five short shafts E^2, E^3, E^4, E^5 and E^6 are arranged in the lower part of the gear box E and each of the shafts E^2-E^6 drives the corresponding shaft a^2-a^6 of the bottom rollers A^2-A^6 . As will be seen from the diagrammatic illustration of the gearing shown in Fig. 8, the shaft E^2 is

driven from the front bottom roller shaft a^1 through the train of gears e and drives the second bottom roller shaft a^2 through the train of gears e^1 . It also drives the second shaft E^3 through the train of gears e^2 . The third bottom roller shaft a^3 is driven from the shaft E^3 through the train of gears e^3 and the shaft E^3 also drives the shaft E^4 through the train of gears e^4 . The fourth bottom roller shaft a^4 is driven from the shaft E^4 through the train of gears e^5 and the shaft E^4 also drives the shaft E^5 through the train of gears e^6 . The fifth bottom roller shaft a^5 is driven from the shaft E^5 through the train of gears e^7 and the shaft E^5 also drives the shaft E^6 through the train of gears e^8 . The sixth bottom roller shaft a^6 (the back bottom roller shaft) is driven from the shaft E^6 through the train of gears e^9 .

The shafts E^2 — E^6 are carried in bearings mounted within the gear box E near the bottom thereof and the axis of each of the shafts E^2 — E^6 is to one or other side of the axis of the corresponding bottom roller shafts a^2 — a^6 as shown in Fig. 4. Each train of wheels e^1 , e^3 , e^5 , e^7 and e^9 driving the bottom rollers shafts a^2 , a^3 , a^4 , a^5 and a^6 from the shafts E^2 , E^3 , E^4 , E^5 and E^6 respectively consists of a wheel 1 on the driving shaft E^2 , E^3 , E^4 , E^5 or E^6 , an intermediate wheel 2 and a wheel 3 on the bottom roller shaft a^2 , a^3 , a^4 , a^5 , or a^6 . Since the positions of the shafts E^2 — E^6 are fixed whilst those of the shafts a^2 — a^6 are capable of adjustment the intermediate carrier wheel 2 of each train is carried mounted on an axle f forming the pivot of a double link F (see Fig. 7) one arm f^1 of which is journaled on the driving shaft E (which is one of the shafts E^2 — E^6) and the other arm f^2 on the driven shaft a (which is one of the bottom roller shafts a^2 — a^6). Thus as the position of the shaft a is moved relative to the position of the shaft E the angle between the two arms f^1 and f^2 of the link F will vary without either of the wheels 1 and 3 becoming disengaged from the intermediate wheel 3. Each shaft a^1 — a^6 is carried by a bearing D^1 — D^6 supported by the side wall of the gear box E and secured in a slot d^1 therein.

Each of the train of wheels e^2 , e^4 , e^6 and e^8 by which the shafts E^3 , E^4 , E^5 and E^6 are driven from the preceding shafts E^2 , E^3 , E^4 and E^5 consists of a wheel 4 on the driving shaft, a single intermediate or carrier wheel 5 (or a compound intermediate or carrier wheel 5^a as between the shaft E^3 and E^4) and a wheel 6 on the driven shaft and to permit of the wheel 6 being changed for a wheel of a different size to vary the relative speeds of the driving or driven shafts when it is desired to vary the speeds of the corresponding bottom roller shafts a^3 — a^6 , the axle of the intermediate wheel 5 or 5^a is journaled in a bearing having an arcuate slot 7 struck from a centre situated on the axis of the driving shaft (see Figs. 5 and 6).

The train of gears e between the bottom front roller shaft a^1 and the shaft E^2 may be arranged outside the gear box E in which case the shaft E^2 projects through the wall of the box. One or more of the wheels in the train e can be changed to vary the speed ratio between the shaft a^1 and the shaft E^2 and consequently between the roller A^1 and the other rollers A^2 — A^6 .

To prevent any back lash between the gears, a fine ratchet wheel G is secured on the shaft

E^2 and is engaged by a pawl g pivoted on a stud in the gear box E .

The gear box E is preferably filled with oil to a level indicated by the line y — y Fig. 4, so that at least one of the wheels of the various trains of gears is wholly or partially immersed in the oil thereby ensuring lubrication of all the gear.

With some kinds of yarn there is a tendency for the fibres of the sliver to spread out and become loose whilst passing through the head and to overcome this tendency means may be provided to gather together the stray or loose fibres and so produce a more compact sliver, roving or yarn.

For this purpose as shown in Figs. 1, 2, 9 and 10, a roller H having a circumferential V groove h in its peripheral surface, is arranged between any adjacent pair of lines of rollers in the head, the roller being suitably supported and driven by frictional contact with a top roller, preferably the rear top roller of the two lines.

The roller H is of relatively small diameter and grooved to receive the roving. Although the roller may be mounted between any adjacent pair of lines of rollers, it is preferably mounted between the front line of rollers A^1 , B^1 and second lines of rollers A^2B^2 as shown in Figs. 1 and 2. If desired a roller H may be inserted between two or more pairs of lines of rollers.

The bearings or supports h^1 for the roller H are preferably carried by a transverse bar or platform H^1 connected to the rear sliver guide J so that it will reciprocate in unison therewith.

In use the sliver passes between the inclined sides of the groove h which collects all stray or scattering fibres and brings the drafted material into a consolidated sliver, roving or yarn.

Alternative construction of fibre consolidating guides are shown in Figs. 11 and 12 and in Figs. 13 to 15. In Figs. 11 and 12 a guide K having two vertical slots h adapted to serve adjacent slivers of each head is adjustably mounted on two rods h^{11} connected to the rear sliver guide J so that the guide K will reciprocate in unison therewith.

In Figs. 13 to 15 a single U shaped pin L or a double U shaped pin L^1 adapted to serve two adjacent slivers is inserted in holes m in a transverse platform or bar M connected to and reciprocating in unison with the bar carrying the rear sliver guides J . With this latter arrangement for threading it is only necessary to remove the pin L or L^1 and replace it over the roving or sliver.

We claim:

1. A drafting head for a textile machine comprising the combination with a plurality of pairs of top and bottom rollers and the shafts on which they are secured of a gear box over which the shafts of the bottom rollers project, a number of short shafts arranged in said gear box, there being one short shaft for each bottom roller shaft other than the front bottom roller shaft, gearing driving the first short shaft from the front bottom roller shaft, gearing driving the second bottom roller shaft from the first short shaft, gearing driving the second short shaft from the first short shaft, gearing driving the third bottom roller shaft from the second short shaft, gearing driving the third short shaft from the second short shaft, gearing driving the fourth bottom roller shaft from the third short shaft, gearing driving the fourth short shaft from the third short shaft and so on, the ratio of the gears being such that the speed of the bottom

rollers progressively decreases, though not necessarily in a constant ratio, from front to back.

2. A drafting head for a textile machine comprising the combination with a plurality of pairs of top and bottom rollers and the shafts on which they are secured of a gear box over which the shafts of the bottom rollers project, a number of short shafts arranged in said gear box, there being one short shaft for each bottom roller shaft other than the front bottom roller shaft, gearing driving the first short shaft from the front bottom roller shaft, gearing driving the second bottom roller shaft from the first short shaft, gearing driving the second short shaft from the first short shaft, gearing driving the third bottom roller shaft from the second short shaft, gearing driving the third short shaft from the second short shaft, gearing driving the fourth bottom roller shaft from the third short shaft, gearing driving the fourth short shaft from the third short shaft and so on, the ratio of the gears being such that the speed of the bottom rollers progressively decreases, though not necessarily in a constant ratio, from front to back, each train of gears between a short shaft and the bottom roller shaft driven therefrom comprising a wheel mounted on the short shaft, a wheel mounted on the bottom roller shaft and an intermediate wheel and means supporting each intermediate wheel and maintaining said wheel in engagement with the other two wheels irrespective of the relative positions of the bottom roller shaft and the short shaft.

3. A drafting head for a textile machine comprising the combination with a plurality of pairs of top and bottom rollers and the shafts on which they are secured of a gear box over which the shafts of the bottom rollers project, a number of short shafts arranged in said gear box, there being one short shaft for each bottom roller shaft other than the front bottom roller shaft, gearing driving the first short shaft from the front bottom roller shaft, gearing driving the second bottom roller shaft from the first short shaft, gearing driving the second short shaft from the first short shaft, gearing driving the third bottom roller shaft from the second short shaft, gearing driving the third short shaft from the second short shaft, gearing driving the fourth bottom roller shaft from the third short shaft, gearing driving the fourth short shaft from the third short shaft and so on, the ratio of the gears being such that the speed of the bottom rollers progressively decreases though not necessarily in a constant ratio, from front to back, each train of gears between a short shaft and the bottom roller shaft driven therefrom comprising a wheel mounted on the short shaft, a wheel mounted on the bottom roller shaft and an intermediate wheel and a two armed link having an arm pivoted on each shaft, the aforesaid intermediate wheel being journalled on the pivot of the two arms.

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