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E. C. GWALTNEY
SPINNING FRAME

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3 Sheets-Sheet 2

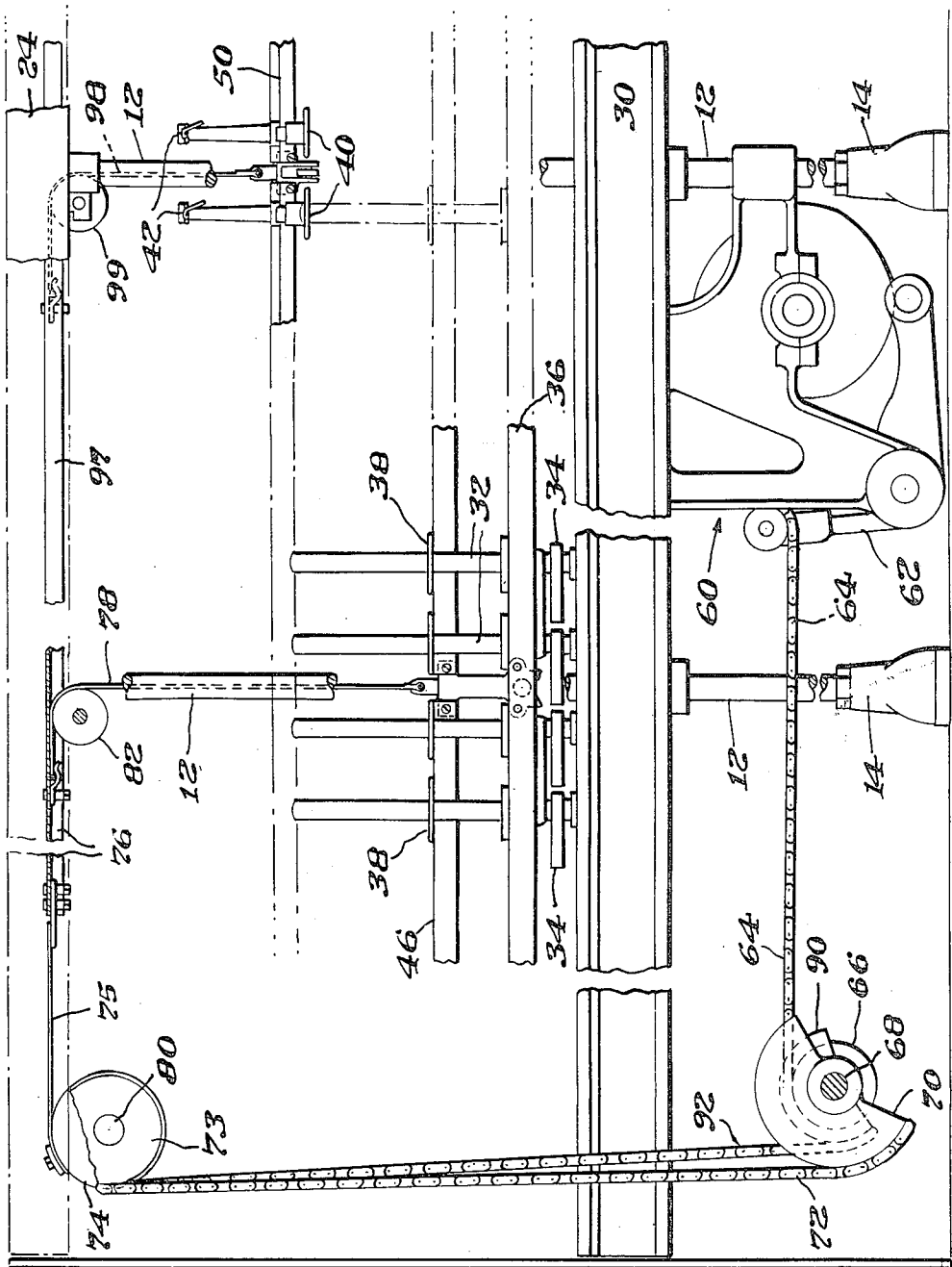


FIG. 2

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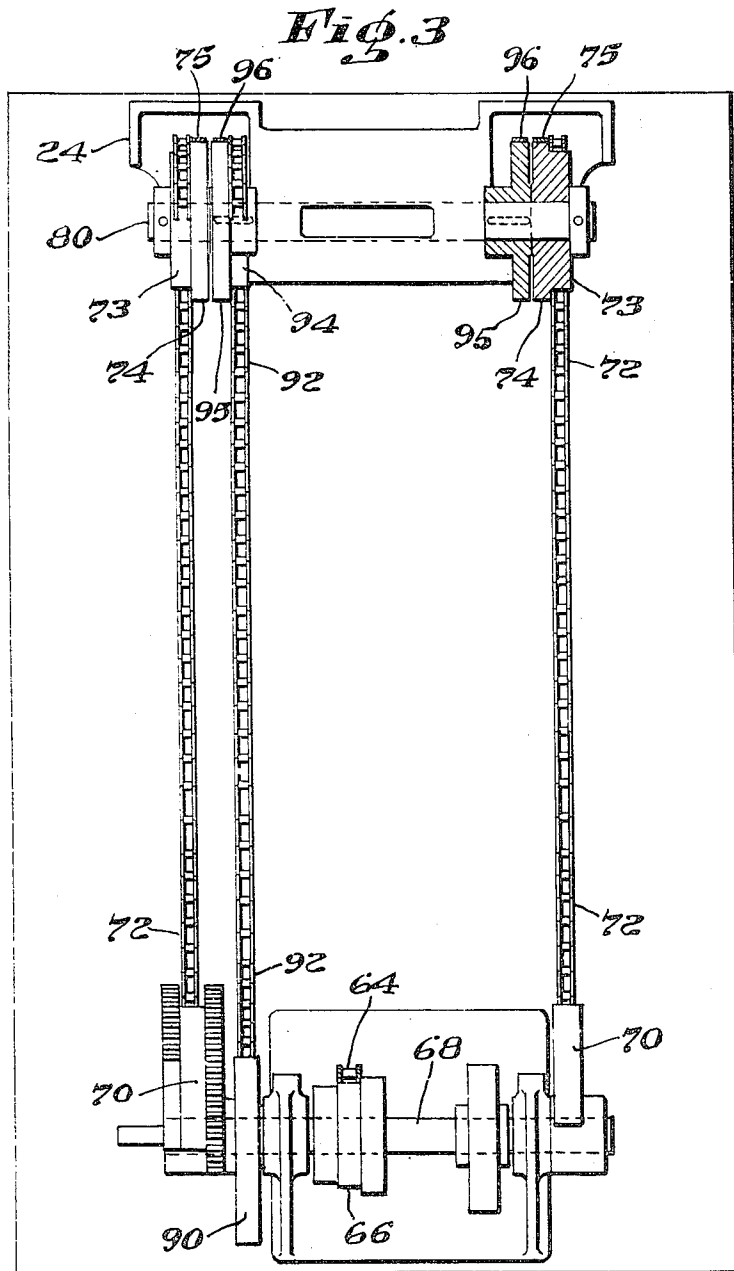
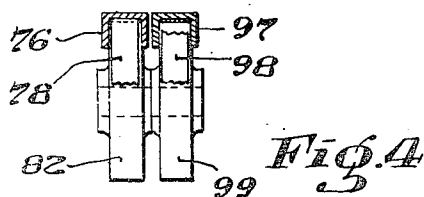
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3 Sheets-Sheet 3



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1

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SPINNING FRAME

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6 Claims. (Cl. 57—99)

This invention relates to textile machinery and more particularly to a novel lifting mechanism for spinning frames and the like.

In order to take full advantage of the modern highly efficient spinning frames the textile industry has in recent years realized that it would be desirable to increase the size of the yarn packages spun on such frames, since larger yarn packages, in addition to further improving the quality of the yarn, would result in lowered costs due to decreased handling during the spinning and subsequent operations. The practically attainable increase in yarn packages has been limited, however, by the lever type of lifting mechanism heretofore used in spinning frames, since if large lifter motions, say of the order of 10 inches or more were used to give yarn packages of considerable length as well as diameter, the necessary space for the travel of the lifting mechanism levers was so great that the spinning frame became too high for convenient operation. Thus, as a practical matter, 8 or 9 inches has heretofore been considered the maximum lifter travel which will permit a spinning frame to be conveniently operated.

In addition, in certain spinning techniques, it has been found desirable to provide more than one lifter travel. For instance, in spinning large packages of fine count yarn, it has been found most effective to move a yarn guide simultaneously with the ring rail but over a shorter path. With the lever type of lifting mechanism, such desirable motions are difficult to achieve, and require the duplication of a large portion of the lifter mechanism. Hence, though known to be desirable, they have not heretofore been in common use.

Accordingly, it is an object of the present invention to provide on a spinning frame a lifter mechanism having an extraordinary large travel, and yet one which permits a spinning frame of a height convenient for commercial use.

It is a further object of the present invention that more than one lifter travel may be easily provided, and thus for the first time make practical the most efficient travel of one or more yarn guides as well as that of the ring rail.

A feature of my novel lifting mechanism is its simplicity, as fewer and lighter parts are required in its construction. Thus, its use will decrease the weight and complexity of modern spinning frames.

For the purpose of more fully explaining a preferred embodiment of my invention, reference is made to the following drawings, in which:

Fig. 1 is a somewhat diagrammatic cross-sectional elevation of a spinning frame embodying my invention;

Fig. 2 is a front elevation of a portion of the spinning frame of Fig. 1;

Fig. 3 is a cross-sectional elevation of the portion of the spinning frame as shown in Fig. 2; and

Fig. 4 is an enlarged view of certain portions of the spinning frame as shown in Fig. 2.

Referring to the drawings, the spinning frame of the type having a plurality of spinning instrumentalities ex-

2

tending along either side of the frame in general includes a plurality of vertical samsons 12, preferably of rod of circular cross section, along each side thereof, said samsons being mounted in pairs opposite one another on base members 14. Upper cross girts 16 and lower cross girts 18 are provided between each pair of samsons 12, the lower cross girts also providing a mounting for the centrally located spindle tape drive cylinder 20. I prefer that lower cross girts 18 be adjustable vertically along samsons 12, said girts including a split sleeve at each end thereof which may be clamped by suitable bolts 22. Roller beams 24, extending along each side of the spinning frame at the upper portion thereof, are mounted on upper cross girts 16, said roller beams serving to support roll stands 26 with suitable drafting elements as well as a central stand 28 on which is mounted a creel (not shown). Spindle rails 30 are mounted on lower cross girts 18 on the outer ends thereof, said spindle rails extending for the entire length of the spinning frame and serving to support a plurality of spindles 32 which are driven from cylinder 20 in the usual manner by tapes 34.

In accordance with my invention, the various yarn guiding devices, i. e. the ring rails 36, lower yarn guide rings 38, upper yarn guide rings 40, and yarn guide eyes 42, are mounted on slides for vertical movement along samsons 12, said samsons, in addition to serving as structural components of the spinning frame, acting as vertical guide members for the slides on which the yarn guiding devices are mounted. The ring rails 36, which extend along the entire length of each side of the spinning frame, are mounted on lower slides 44, such a lower slide preferably being mounted on each of the samsons 12 and thus supporting the ring rails at horizontally spaced intervals. The lower yarn guide rings 38 are also mounted on said slides by the use of lower ring bars 46 which extend for substantially the entire length of each side of the frame above the ring rails 36. The lower rings 38 encircle the spindles 32 above the traveler rings in the ring rail, and move vertically with the ring rails, as hereinafter more fully explained, to build the yarn into a package on the spindle in the usual manner. The pairs of lower slides 44 on opposite sides of the spinning frame are connected by tie rods 45, the tie rods preferably being of adjustable length to conform at all times to the spacing between the samsons 12 as the slides 44 move vertically along the samsons. Thus it is unnecessary to provide accurate spacing between the samsons 12 in order to achieve free movement of the slides 44 along said samsons.

The upper yarn guide rings and the yarn guide eyes are mounted, through an upper rail 50 which extends for substantially the entire length of the frame, on upper slides 48. Such upper slides are preferably mounted on each of the samsons 12, thus supporting said rail 50 at horizontally spaced intervals. The upper rings 40 are mounted in position on rail 50 to encircle each of spindles 32 at the upper portion thereof, while the guide eyes 42 are mounted in a position above the top of each of said spindles. The upper rings 40 and guide eyes 42 are together moved vertically to guide the yarn to travelers on the rings in ring rail 36, all of said guiding devices, together with the spindles 32, being generally referred to as spinning instrumentalities. Adjustable tie rods 52 preferably connect pairs of upper slides 48 in order that the slides may move freely along the samsons 12.

The tie rods 45 and 52 are similar, and, to provide for automatic adjustment of their length to conform to slight variations in the horizontal spacing between pairs of samsons 12, include pistons 53 and cylinder 54 loaded by a spring 55, the cylinder confining lateral movement of the spring 55 which acts to urge the slides 44 or 48 outwardly so that their pulleys 47 are resiliently pressed against the inner sides of samsons 12. This permits slight move-

ment of a pair of slides axially of the spring and tie rod so that the yarn guiding devices will remain concentric with the spindle, that is, in axial alignment therewith, even though samsons 12 are not accurately spaced.

The yarn guiding devices are moved vertically by a builder mechanism of a type well known in the art, and generally designated at 60, such a builder mechanism providing a slow reciprocating motion which is used to operate yarn guiding devices for obtaining a desired wind for the yarn packages. As is well known, builder mechanisms may be of various types depending upon the type of wind, for instance, warp, filling, or combination wind are the general classes of builders. The builder 60 is mounted on the lower portion of the spinning frame on a pair of samsons 12. The arm 62 of said builder mechanism reciprocates builder chain 64 attached at one end thereto, the other end of said chain being attached to a point on the outer surface of disk 66 mounted on shaft 68, said shaft being rotatively mounted on the spinning frame at one end thereof. Pulleys are affixed to shaft 68, the ring rail driving pulleys 70 and the yarn guide driving pulley 90, said pulleys being reciprocated by the builder mechanism 60 to drive the ring rails 36 and lower rings 38, and to drive the upper rings 40 and yarn guide eyes 42 respectively along samsons 12 to provide the lifter motion. Ring rail driving pulleys 70 have a greater driving lever arm than that of the yarn guide driving pulley 90, thus the ring rails 36 and lower rings 38 will reciprocate over a greater distance, though simultaneously with, upper rings 40 and yarn guide eyes 42, giving a greater and less lifter motion travel respectively. Since the ring rails 36 are a relatively heavy assembly, I prefer to provide a pair of pulleys 70 on the opposite sides of the frame, the outer surface of said pulleys 70 being connected by vertical driving chains 72 to the outer surface of chain disks 73 mounted for free rotation on a shaft 80 rotatably mounted on the spinning frame above shaft 68. The chain disks 73 are attached to tape disks 74 connected by flexible metallic tapes 75 to ring rail connecting rods 76, said ring rail connecting rods extending horizontally along the entire length of the spinning frame at either side thereof above the spinning instrumentalities. The connecting rods 76 are attached to each of lower slides 44 by means of flexible metallic tapes 78, said tapes being attached to said connecting rods and led over pulleys 82 on upper girts 16 over slides 44, and then downwardly to said slides. Thus, the ring rails 36 and lower rings 38 will be vertically reciprocated by the builder mechanism 60 by a driving connection which includes builder chain 64, ring rail pulleys 70, vertical chains 72, disks 73 and 74, connecting rods 76 and tapes 78.

The upper rings 40 and the yarn guide eyes 42 are similarly reciprocated from the yarn guide driving pulley 90, said pulley having attached to the outer surface thereof a vertical chain 92 the other end of which is attached to the surface of a chain disk 94 affixed to shaft 80. Tape disks 95 are affixed to said shaft on opposite sides of the spinning frame, so that movement of chain disk 94 will move tape disks 95. The tape disks 95 are connected by flexible metallic tapes 96 to yarn guide connecting rods 97, said yarn guide connecting rods extending horizontally along the entire length of the spinning frame adjacent the ring rail connecting rods 76. The yarn guide connecting rods 97 are attached to each of upper slides 48 by means of flexible metallic tapes 98, said tapes being attached to said connecting rods and led over pulleys 99 on upper girts 16 over slides 48, and then downwardly to said slides. Thus, when the builder mechanism 60 is operated, the upper rings 40 and yarn guiding eyes 42 will be reciprocated vertically by a driving connection which includes builder chain 64, yarn guide pulley 90, vertical chain 92, disks 94 and 95, connecting rods 97, and tapes 98, though the resulting reciprocating lifter travel motion will be smaller and consequently at a lower rate of speed

than that of the ring rails since the yarn guide pulley 90 lever arm is smaller.

It will be understood that I contemplate varying the lifter motion travel of either the ring rail or the yarn guide or both of them by the use of suitable pulleys. Also, under some circumstances, it may be necessary to provide a lifter motion for the ring rail alone, in which case the yarn guide lifter mechanism could be rendered inoperative, such as by disconnecting vertical chain 92.

Thus it will be seen that I have provided a spinning frame lifter mechanism which will permit the use of far greater lifter motion travel without the necessity for increasing the vertical height of the frame, since, due to the decreased requirements for clearance beneath the ring rail, the entire ring rail may be made much closer to the floor. Furthermore, my novel lifter mechanism permits the easy use of more than one simultaneous lifter travel, as is desirable with certain spinning techniques, and, with a spinning frame having smooth vertical samsons, allows the use of such samsons as guide members in addition to their use as frame members, although it will be understood that I do not wish to confine my invention to such an arrangement, as the guide members might well be separate from the frame samsons.

Other modifications within the spirit of my invention and the scope of the appended claims will occur to those skilled in the art.

I claim:

1. A lifting mechanism for spinning frames of the type having a plurality of spinning instrumentalities extending along either side of a frame including spindles on opposite sides of said frame, a plurality of horizontally spaced vertical guide members on opposite sides of said frame, slide means mounted on said guide members for vertical movement on said guide members, yarn guiding devices mounted on and movable with said slide means, tie rods extending between said slide means on opposite sides of said frame and vertically movable with said slide means for maintaining said yarn guiding devices in axial alignment with the respective spindles, means for moving said slide means and said yarn guiding devices including a builder mechanism arranged and controlled to provide a reciprocating builder motion and drive means connecting said builder mechanism and said slide means for moving said slide means along said guide members in response to the movement of said builder mechanism.

2. A lifting mechanism as claimed in claim 1 in which said tie rod members are resiliently extensible to conform to the spacing between said vertical guide members.

3. A lifting mechanism for spinning frames of the type having a plurality of spinning instrumentalities extending along either side of a frame, including a plurality of horizontally spaced vertical guide members on opposite sides of said frame, ring rails mounted on said guide members on each side of said frame for vertical sliding movement on said guide members, yarn guide support means on each side of said frame mounted on said guide members above said ring rails for vertical sliding movement of said guide members at a different rate than that of said ring rails, said guide members carrying both a ring rail and a yarn guide support means, yarn guiding devices mounted on and movable with said yarn guide support means, resiliently extensible tie rods extending between said yarn guide support means and vertically movable with said yarn guide support means, means for moving each of said ring rails and said yarn guide support means including a builder mechanism arranged and controlled to provide a reciprocating builder motion and drive means extending between said builder mechanism and said ring rails and between said builder mechanism and said yarn guide support means.

4. A lifting mechanism as claimed in claim 3 in which said drive includes a ring rail driving pulley and a yarn guide support means driving pulley each rotatively moved by said builder mechanism, said ring rail driving pulley

5

having a greater driving lever arm than said yarn guide support means driving pulley lever arm, driving means extending between said ring rail and said ring rail driving pulley for moving said ring rail vertically along said guide members, and driving means extending between said yarn guide support means and said yarn guide support means driving pulley for moving said yarn guide vertically along said guide members, whereby movement of said builder mechanism simultaneously moves said ring rail and said yarn guide support means and reciprocates said ring rail over a greater vertical distance than said yarn guides.

5. A lifting mechanism as claimed in claim 4, in which each of said ring rail and yarn guide support means driving mechanisms include a connecting rod extending horizontally along the upper portion of said frame, said ring rail connecting rod and said yarn guide support means connecting rod being moved by said ring rail driving pulley and said yarn guide support means driving pulley respectively, and said ring rail connecting rod and said yarn guide support means connecting rod being connected to said ring rail and yarn guide support means respectively by flexible means extending therebetween, said flexible means being attached to said connecting rods and

6

being led around pulleys on said frame for moving vertically said ring rails and said yarn guides.

6. A lifting mechanism as claimed in claim 1 in which said drive means includes a yarn guiding device pulley rotatively moved by said builder mechanism, and a connecting rod moved by said pulley extending horizontally along the upper portion of the frame, said connecting rod being connected to said yarn guiding devices by flexible means extending therebetween, and said flexible means being attached to said connecting rod and being led around pulleys on said frame for moving vertically said yarn guiding devices.

References Cited in the file of this patent
UNITED STATES PATENTS

624,148	Allgood	May 2, 1899
1,039,905	Culver	Oct. 1, 1912
1,577,870	Potter	Mar. 23, 1926
1,820,310	Kooistra	Aug. 25, 1931
1,892,343	Hess	Dec. 27, 1932
2,122,434	Morton	July 5, 1938
2,188,376	Scio	Jan. 3, 1940
2,732,683	Hoffmann	Jan. 31, 1956