Oct. 12, 1937. W. REINERS ET AL 2,095,530

SORTING APPARATUS

Filed July 9, 1935 3 Sheets-Sheet 1

Fig. 1.

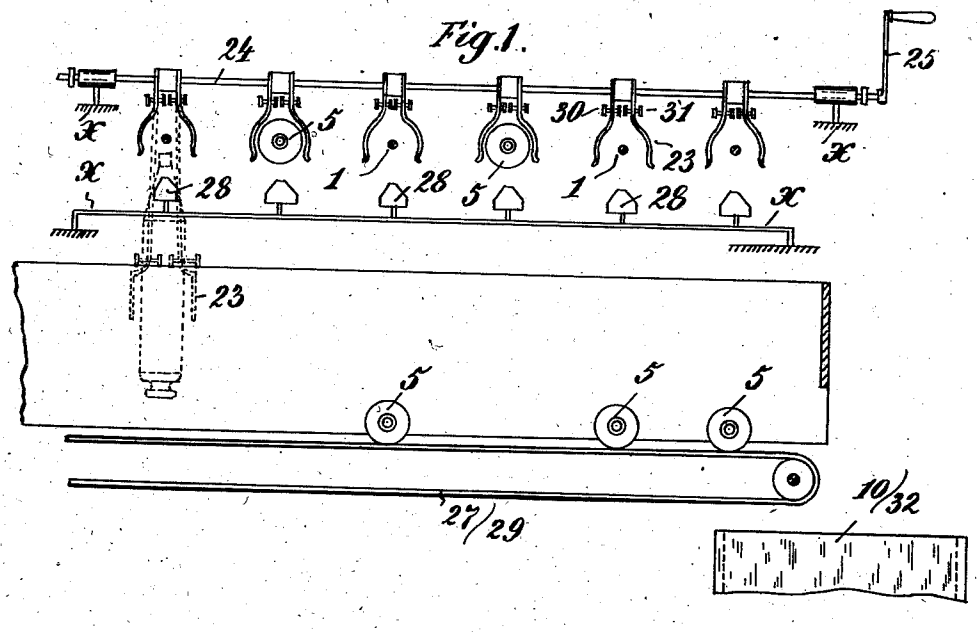
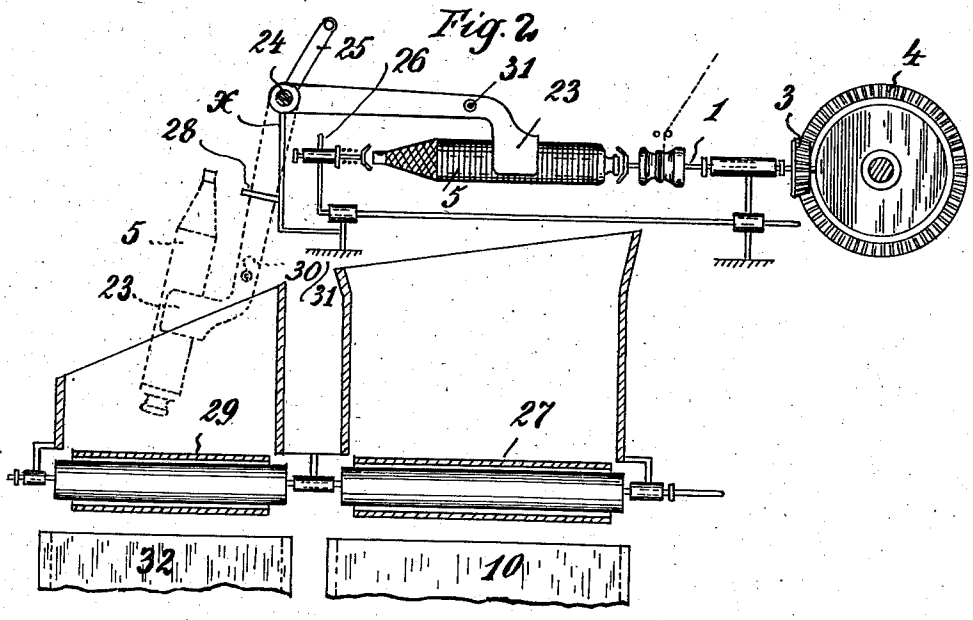



Fig. 2.




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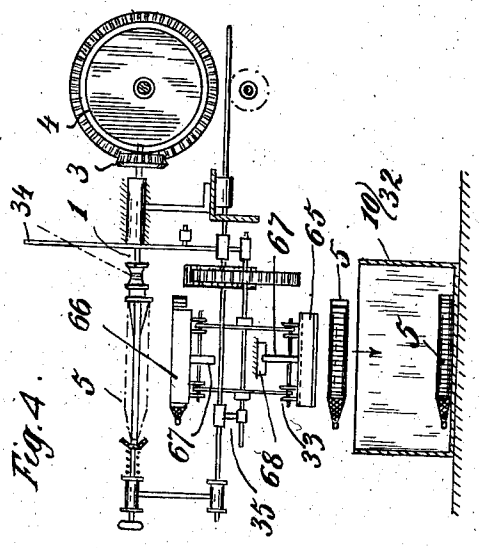



Fig. 4.

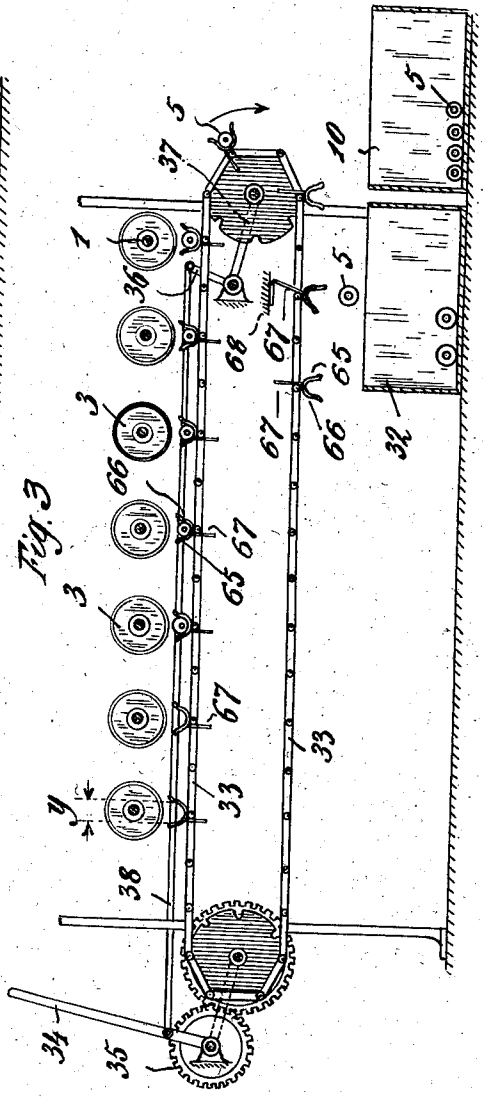



Fig. 3

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SORTING APPARATUS

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3 Sheets-Sheet 3

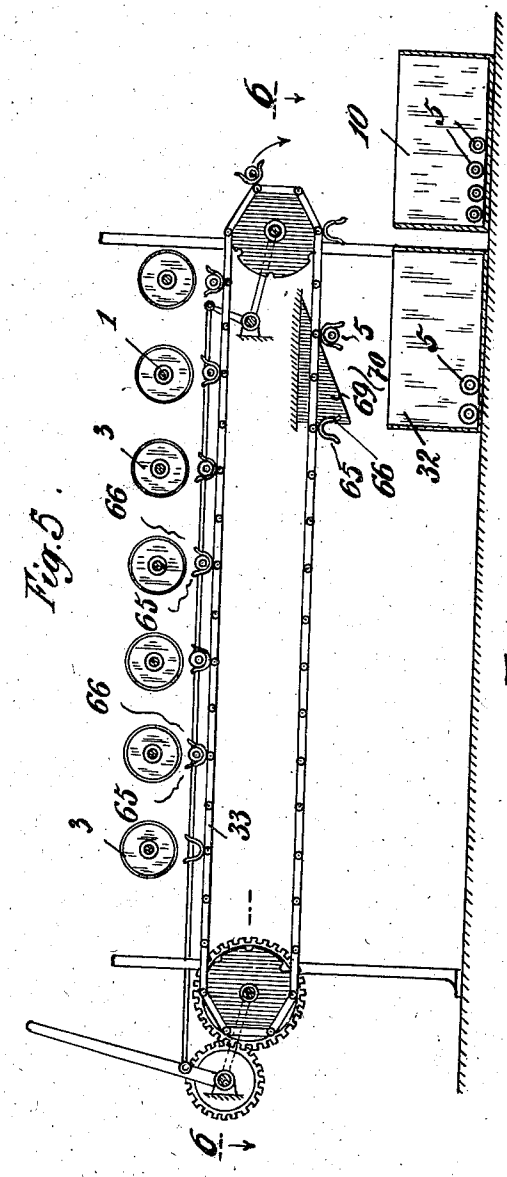



Fig. 5.

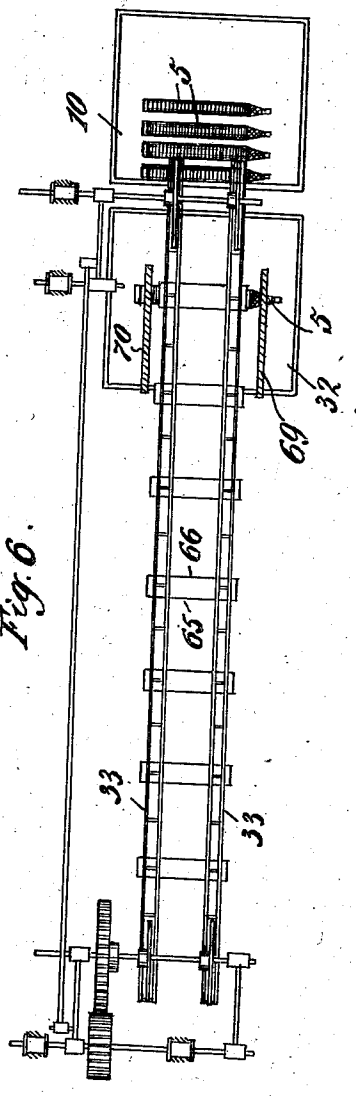



Fig. 6.

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# UNITED STATES PATENT OFFICE

2,095,530

## SORTING APPARATUS

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Application July 9, 1935, Serial No. 30,556
In Germany August 13, 1934

5 Claims. (Cl. 209—82)

The invention is an improvement in, or modification of, the invention claimed in our specification Ser. No. 708,708, relating to apparatus for automatically sorting cops doffed from the spindles of winding machines, so that cops of different diameters are separately collected. It happens with comparative frequency that from some accidental cause, e. g. unequal thickness of yarn or temporary slackening of yarn tension, some cops are thicker than others, and it is frequently necessary or desirable to sort out such cops.

The invention is illustrated in the accompanying drawings, showing several examples of the improved apparatus.

Figs. 1 and 2 are respectively a front view and a side view (the latter in section) showing one form of construction,

Figs. 3 and 4 are a front view and a sectional side view showing another form of construction.

Fig. 5 is a front elevation of another form of device embodying the invention, and

Fig. 6 is a section on the line 6—6 of Fig. 5.

Referring first to the construction shown in Figs. 1 and 2, 1 designates one of the spindles, which is mounted in a bearing 2 and is driven by friction wheels 3, 4; 5 is the cop on the spindle. Boxes 10 and 32 for receiving the doffed cops may be placed below the spindle.

For each spindle there is a clip 23, the clips being carried by a shaft 24, which can be rotated by means of a handle 25, so that the clips can be swung from the position shown in full lines to that shown in broken lines, and back. In the example shown the cop tubes are driven by means of stub spindles, but with suitable modifications the device can be used also with spindles extending through the tubes. When the cops have been wound the clips are swung into the full line position. The clearance between their elastic jaws is such that the jaws do not grip cops which do not exceed the proper diameter, but they do grip cops exceeding that diameter. Consequently, when the front stub spindles 26 are retracted the cops of the proper diameter drop on to an endless conveyor 27, whereas thicker cops are retained by the clips which have engaged them. The clips are then swung into the broken line position, taking with them such cops as exceed the proper diameter. On approaching the end of their movement the shanks of the clip jaws strike wedge shaped abutments 28 whereby they are spread apart, so the thick cops which have been sorted out are dropped on to a conveyor 29, whence they are discharged into compartment 32. Cops of the proper diameter are discharged by conveyor 27 into compartment 10. The clearance between the jaws can be regulated by means of screws 30, 31.

In the modification shown in Figs. 3 and 4 a conveyor 33 is mounted below the spindles 1, being guided upon two sprockets 40, one of which can be driven, at proper times, by a driving gear 39. The sprockets 40 are mounted upon bell crank levers 35, 36; the lever 35 being provided with a handle 34 connected by a link 38 with the upright arm of bell crank lever 36. Thus the conveyor can be raised by swinging lever 34, 35 to bring its upper span to the level of the spindles. The conveyor carries cop clips, each consisting of two elastic jaws 65, 66, the jaw 65 being fixed to the conveyor and the jaw 66 being pivoted to the conveyor so that it can be swung outwards against the action of a spring (not shown). The jaw 66 has a finger 67 projecting through the conveyor. Cops of the proper diameter entering the clips when the conveyor is lifted to the level of the spindles for doffing are not gripped tightly by the jaws, and are discharged into the box 10 when the conveyor, lowered to its normal level, is set in motion toward the right. Thick cops, however, are gripped tightly, so that the clips carry them past the box 10. Above a box 32 there is an abutment 68 in the path of the fingers 67, which causes the jaws 66 to swing outwards, so that the thick cops are dropped into the box 32.

Figs. 5 and 6 show a modification in which the clips also elastically grip thick cops by means of elastic jaws 65, 66 but drop cops of the normal diameter into a box 10. Above the box 32 there are two abutments 69, 70 with inclined edges, placed so that the ends of thick cops gripped by the clips strike these edges, which push such cops out of the clips, causing them to drop into the box 32.

We claim:

1. Sorting apparatus comprising in combination, means for supporting a bank of articles to be sorted, a bank of grippers simultaneously movable into engagement with the articles, respectively, and adapted to grip articles larger than a predetermined size and to not grip articles of the predetermined size or smaller, means for discharging the smaller articles while the larger articles are held by the grippers, means for conveying the larger articles to a position removed from the discharging point for the

smaller articles, and means for releasing the larger articles at said removed position.

2. Sorting apparatus comprising in combination, means for releasably holding a bank of articles to be sorted, a bank of grippers simultaneously movable into engagement with the articles, respectively, and adapted to grip articles larger than a predetermined size and to not grip articles of the predetermined size or smaller, means for releasing all of the articles from the holding means, and means for moving the bank of grippers to a different position and there discharging the larger articles.

3. Sorting apparatus comprising in combination, means for releasably holding a bank of articles in elevated position, a bank of grippers movable from above into engagement with the articles, respectively, and adapted to grip articles larger than a predetermined size and to not grip articles of the predetermined size or smaller, means for releasing all of the articles from the holding means, whereupon the smaller articles fall away from the grippers, and means for moving the grippers to a different position and there discharging the larger articles.

4. Sorting apparatus comprising in combination, means for supporting a bank of articles in elevated position, a bank of grippers movable into engagement with the articles, respectively, and adapted to grip articles larger than a predetermined size and to engage without gripping articles of the predetermined size or smaller, means for shifting the bank of grippers to a position where the smaller articles will fall away from the grippers and then to a second position, and means releasing the larger articles from the grippers at said second position.

5. Sorting apparatus comprising in combination, means for releasably holding a horizontally disposed bank of articles, an endless conveyor horizontally disposed beneath said bank of articles, a bank of grippers mounted upon said conveyor, means for elevating said grippers into engagement with the articles, respectively, said grippers being adapted to grip articles larger than a predetermined size and to not grip articles of the predetermined size or smaller, means for releasing all the articles from the holding means, means for driving the conveyor to convey the articles away from their original positions, whereupon the smaller articles fall away from the grippers as they successively reach the turning point of the conveyor, and means successively releasing the larger articles at a more advanced position.

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