

March 26, 1940.

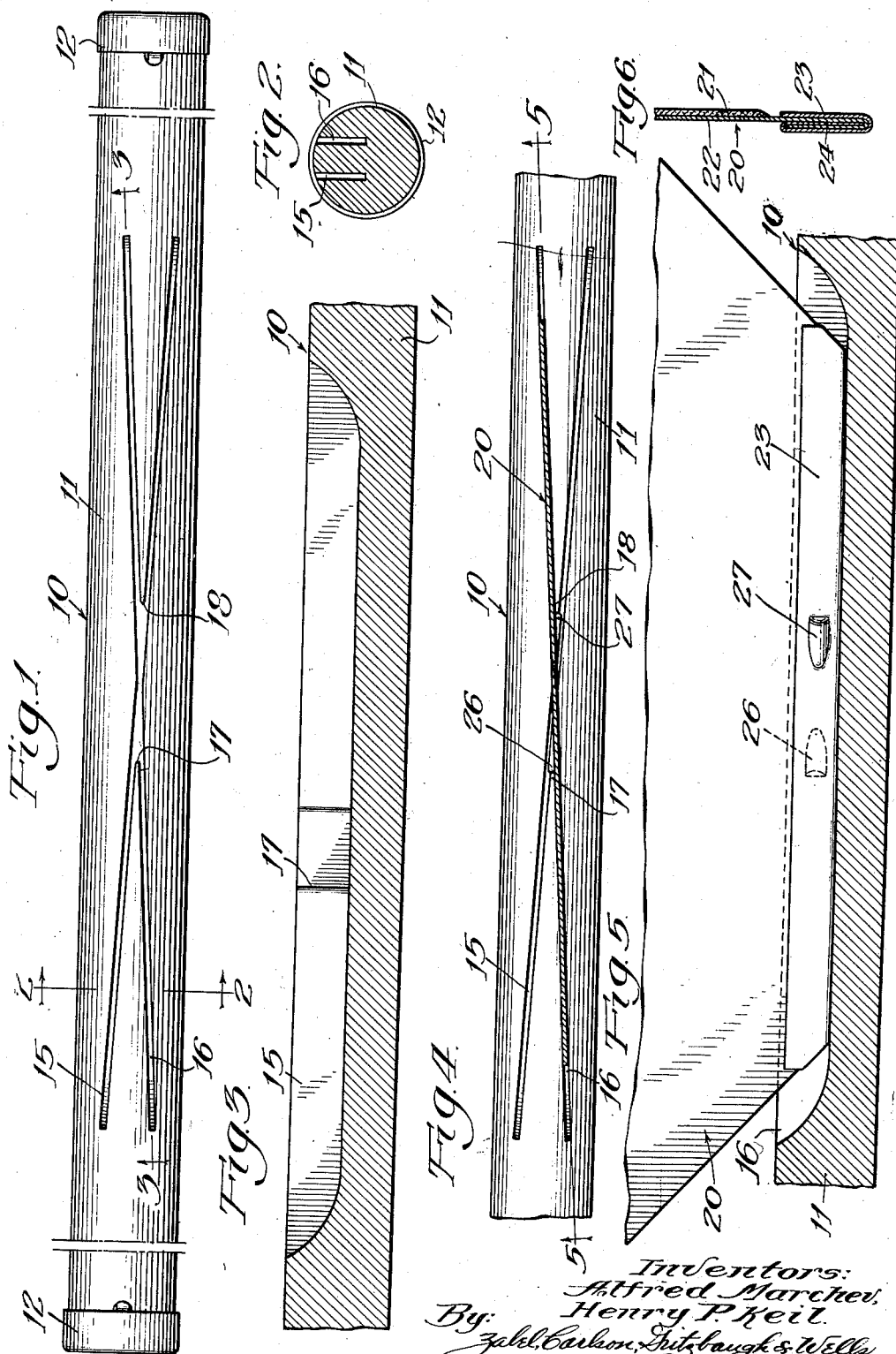
A. MARCHEV ET AL

2,194,560

SPINDLE AND BAND ADAPTED TO BE WOUND THEREON

Filed June 19, 1937

2 Sheets-Sheet 1



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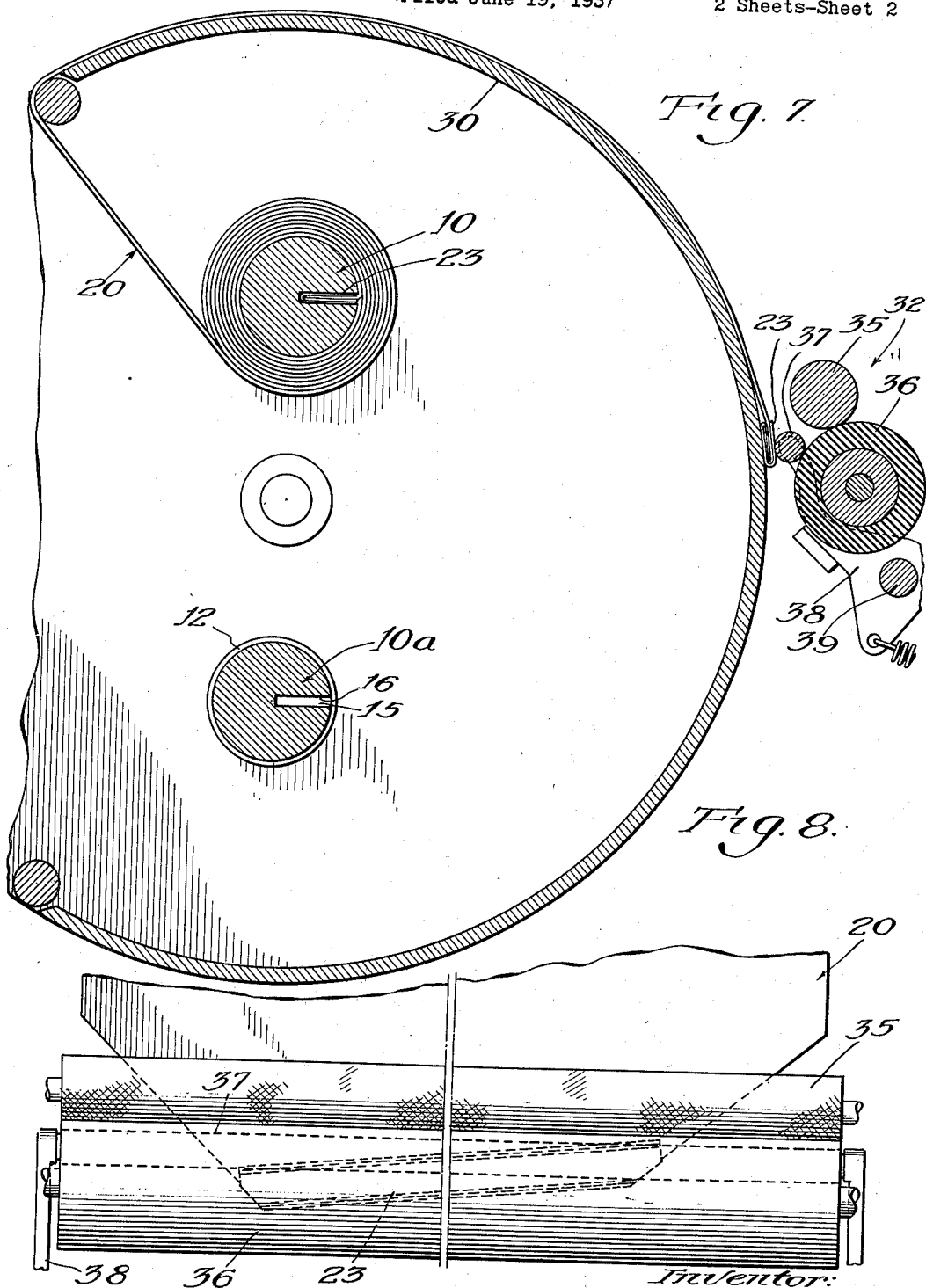
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UNITED STATES PATENT OFFICE

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SPINDLE AND BAND ADAPTED TO BE
WOUND THEREON

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Application June 19, 1937, Serial No. 149,074

4 Claims. (Cl. 242—74)

The invention relates to spindles and bands adapted to be wound thereon and is particularly adapted to be embodied in spindles and hectograph bands for hectograph duplicating machines.

5 In duplicating machines of the hectograph type, the duplicating surface is preferably a coating of gelatin applied to a sheet or band of fabric, paper, etc., the ends of the band being provided with metallic clips strongly secured on the
10 band whereby the ends of the band may be secured detachably to spindles. The band is wound from one spindle to the other to advance the gelatin surface along the bed or platen of the duplicating machine.

15 One form of the invention is embodied in an improved spindle and a hectograph band or roll, the spindle being cylindrical and being provided with at least one slot in its cylindrical surface, which slot extends diagonally or rather, at a small
20 angle to the longitudinal axis of the spindle. The band is provided with metallic clips or ends, which clips are at a small angle to a line at right angles to the side edges of the band, the construction being such that when the metallic clip or
25 end is inserted in the slot of the spindle, the band may be wound around the spindle and will wind thereon in superimposed layers aligned with each other. With such construction, one may pull the band through a relatively small space when the
30 band is being removed from the duplicating machine and there will be substantially no danger that the metallic clip will be torn from the band.

Other objects and advantages will become apparent as the following detailed description progresses, reference being had to the accompanying
35 drawings, wherein—

Fig. 1 is a side elevation of the spindle which embodies the invention.

Fig. 2 is a section taken on line 2—2 of Fig. 1.

40 Fig. 3 is a fragmentary section taken on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary side elevation of the improved band showing the improved band in section and applied to the spindle.

45 Fig. 5 is a section taken on line 5—5 of Fig. 4.

Fig. 6 is a fragmentary section taken through one end of the improved band and a metallic clip secured to that end.

50 Fig. 7 is a somewhat diagrammatic longitudinal section taken through the hectograph duplicating apparatus which includes the improved spindle and the improved band, and

Fig. 8 is a side elevation of part of the apparatus shown in Fig. 7.

55 While the invention is disclosed in connection with duplicating apparatus, it is to be understood that the invention is limited to this use only to the extent indicated in the appended claims.

60 Referring to the drawings wherein a preferred embodiment of the invention is illustrated, the

reference character 10 designates generally a spindle which preferably comprises a body portion 11 formed of wood, the ends of the body portion 11 being provided with metallic caps 12 whereby the spindle may be journaled in a duplicating machine. The body portion 11 is preferably cylindrical and is provided with two slots or grooves 15 and 16 which extend at small angles to the longitudinal axis of the body portion 11 and intersect each other intermediate their ends
10 so as to provide two shoulders 17 and 18 for a purpose hereinafter described. It will be noted that where the slots 15 and 16 intersect or cross each other, the resulting single slot is wider at its ends than the individual slots 15 and 16. 15

Adapted to be secured detachably to the spindle 10 and to be wound thereon, is an improved hectograph band 20 which comprises a layer of gelatin 21 adhering to a backing band 22 of paper, the ends of the paper band 22 being reenforced
20 by metallic clips 23. It will be noted that each end of the paper backing 22 is folded back and a portion 24 of the clip 23 is disposed between the folded portion of the paper backing and the unfolded portion. This construction assures that
25 the clip 23 will not slip off of the end of the paper backing. At the same time it provides a very thin clip which is advantageous for a reason hereinafter set forth. Each of the metallic clips 23 has lugs 26 and 27 struck outwardly from
30 it intermediate its ends. The lug 26 is at one side of the clip and the lug 27 is at the other side of the clip. The lugs 26 and 27 are adapted to abut against the shoulders 17 and 18 as best illustrated in Fig. 4. In that figure, the clip is
35 sectioned as if it were a solid member, but this has been done in view of the small scale to which the figure is drawn. In Figs. 4 and 5, the clip 23 is shown inserted in the slot 16 but if the band is reversed face for face or is wound reversely on
40 the spindle the clip will fit the same way in the slot 15. Such reversals are not contemplated as being likely in connection with hectograph machines but might be employed either in such machines or in other situations for which our arrangement is provided. It will be noted from Fig.
45 5 that the clip preferably is narrower in width than the depth of the slot or groove so that it does not extend above the cylindrical surface of the body portion 11. 50

As best illustrated in Fig. 8, the clip 23 is not attached to the end of the band 20 at right angles to the side edges of the band. Instead, the clip 23 is attached to the band at a small angle
55 to any line extending at right angles to the side edges of the band. The angle which the clip 23 makes with a line extending at right angles to the side edges of the band 20 is substantially equal to the angle which each of the slots 15 and 16 60

makes with the longitudinal axis of the body portion 11.

In Fig. 7, a section is shown through duplicating apparatus which includes a duplicating drum 30 rotatably mounted in a frame (not shown). The spindle 10 is rotatably journaled in the end walls of the drum 30 and a second spindle 10a is likewise journaled in the end walls of the drum 30. The spindles 10 and 10a are identical in construction. The band 20 is shown partly wound around the spindle 10, the clip 23 at one end of the band being inserted in one of the slots 15 or 16. The other end of the band is shown in a position adjacent mechanism 32 for stripping copy sheets from the gelatin band when the machine is in operation. The band 20 is shown at an intermediate position through which it moves in its application to the machine. When the duplicating machine is in operation, the clip shown adjacent the stripping mechanism 32 is held in one of the slots of the spindle 10a and the band is partially wound on the spindle. This construction enables the operator to advance the band from the spindle 10a to the spindle 10 by suitable mechanism (not shown). However, when the band 20 has been unwound from the spindle 10a, it is usually replaced with another band, and for this reason it is wound entirely upon the spindle 10 before it is removed from the drum 30. It will be noted that the stripping mechanism comprises rollers 35, 36 and 37. The roller 37 is carried by brackets 33 pivoted upon a shaft 39. When the duplicating apparatus is in operation, the roller 37 enters an opening in the drum 30 once during each cycle of operation to intercept the leading edge of a copy sheet and swings this edge out of the opening and toward the bight of the rollers 35 and 36, which rollers strip the copy sheet from the band 20. It will be readily understood that the roller 37 must make its movements in a very small period of time as otherwise it will be necessary to leave relatively long unused margins on the leading edges of the copy sheets. It will also be understood that due to the speed at which the roller 37 moves inwardly and outwardly with respect to the drum 30 its weight should be small to prevent vibration, etc., and its diameter should also be small to make the distance through which it oscillates as small as possible. It is also necessary that the outermost position of the roller 37 with respect to the drum 30 should be as close as possible to the drum to make the distance through which the roller oscillates as small as possible. Heretofore, when bands employing clips having outstanding flanges were employed, the roller 37 would oftentimes tear the clips from the paper backing while the band was being wound around the spindle 10. Also, when thin clips were used without outstanding flanges, the clips would become bent and would not pass readily between the outer surface of the drum 30 and the roller 37. This sometimes resulted in injury to the band as the roller 37 would tear the clips from the bands. In Fig. 8, the clip 23 at one end of the band 20 is shown passing between the drum 30 and the roller 37. It will be noted that one end of the clip first contacts the roller 37 and that the clip advances through the space between the drum 30 and the roller 37 at an angle to the longitudinal axis of the roller 37. In this arrangement, the clip readily wedges its way through the space between the roller 37 and the drum 30 even if the clip is somewhat deformed from use. In prac-

tice, it has been found that one may draw the clip 23 quickly through the space between the roller 37 and the drum 30 with very little danger that there will be any tearing of the paper backing.

While we have shown and described certain embodiments of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is our intention to claim all novelty inherent in our invention as broadly as permissible, in view of the prior art.

We claim:

1. A spindle comprising a cylindrical body portion having two intersecting slots in its cylindrical surface at an acute angle to each other providing a widened groove portion at the point of intersection having shoulders adapted to engage projections on the end of a band inserted into one of said slots for holding the band from movement longitudinally of the spindle, said slots extending at acute angles to the longitudinal axis of said body portion.

2. A spindle of the type described, comprising a cylindrical body portion having a slot in its surface from about one end of the spindle to the other end and positioned at a slight angle from the axis of the spindle and adapted to receive the end portion of a band for connection of the band to the spindle, said spindle having a second slot in its surface intersecting said first named slot at a slight angle thereto so as to provide a widened slot portion at the point of intersection, shoulders extending in substantially radial direction being provided at opposite end portions of said widened slot portion adapted by engagement with projections on the end portion of said band to hold the band from lateral movement longitudinally of the spindle.

3. As a new article of manufacture, a cylindrical spindle having a deep groove therein from about one end of the spindle to the other end and positioned at a slight angle from the axis of the spindle with the middle portion of the groove longitudinally thereof disposed in substantially radial position, said spindle having a second groove therein intersecting said first named groove at a slight angle thereto so as to provide a widened groove portion at the point of intersection, with shoulders at the ends of said widened groove portion extending in substantially radial direction so as to engage projections on the end of a band inserted into said deep groove for holding the band from movement longitudinally of the spindle.

4. The combination of a spindle comprising a cylindrical body portion having two intersecting slots in its cylindrical surface, said slots extending at acute angles to the longitudinal axis of said body portion and forming opposing shoulders at their intersection, and a band adapted to be wound around said body portion in aligned convolutions and having a clip adapted to seat in either of said slots, said clip having projections to abut against said shoulders to hold the clip in a predetermined position in the slot and said clip being attached to one end of the band at an acute angle to a line extending at right angles to the side edges of the band.

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