

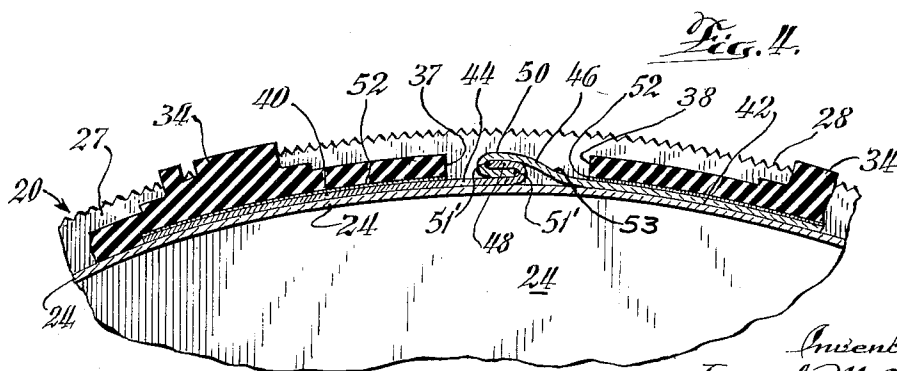
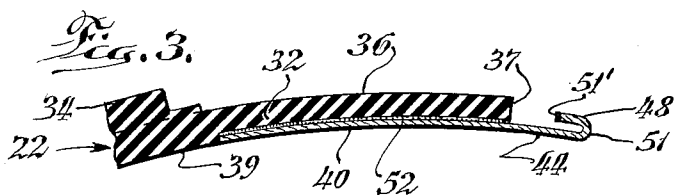
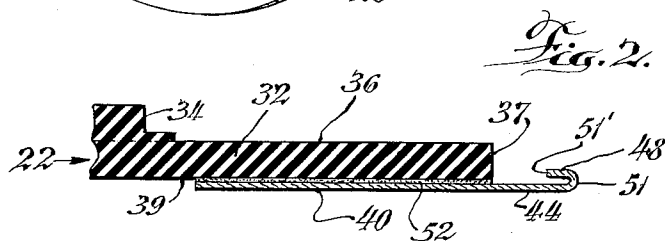
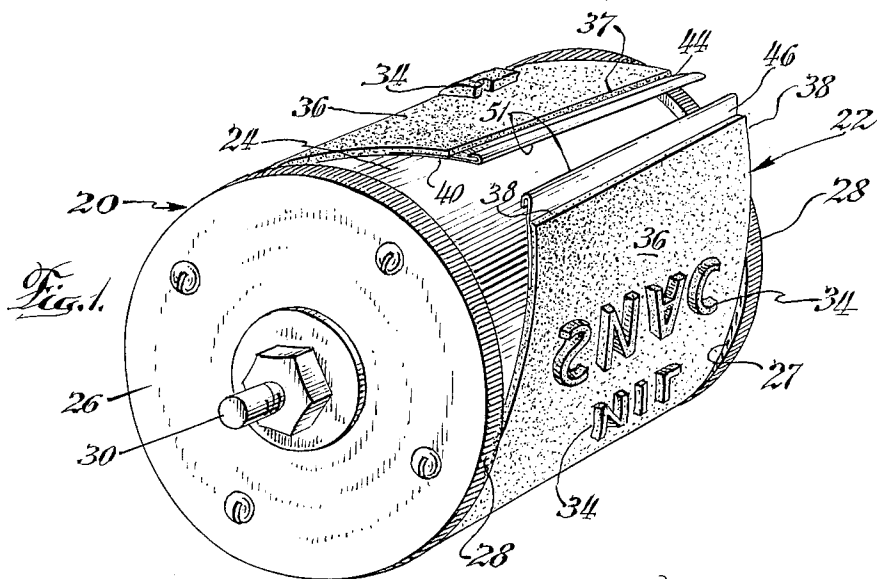
Oct. 26, 1965

J. G. MCKAY

3,213,790

ELASTIC PRINTING BAND

Filed March 13, 1963



Inventor:
James G. McKay
By *Silverman, Mullin, Cass & Kaufman*
Attorneys

1

3,213,790

ELASTIC PRINTING BAND

James G. McKay, 5138 N. Mobile, Chicago, Ill.

Filed Mar. 13, 1963, Ser. No. 264,874

8 Claims. (Cl. 101—415.1)

This invention relates generally to rubber printing bands and more particularly, relates to an elastic rubber printing band or plate having novel hook means at the opposite ends thereof adapted to be cooperatively interengaged for releasably mounting the printing band on the printing cylinder of a flexographic printing machine or the like.

Rubber printing plates or bands of the general type with which the invention is concerned are widely used for selectively printing certain desired characters of indicia on packages. Such indicia, for instance, may identify flavors of products packaged or consist of code dating widely used to control movement of products to and from shelves of a business establishment. In any event, such printing bands comprise strips of rubber carrying type formations molded on a surface thereof and the printing bands are secured on the printing cylinder of a printing machine. The printing cylinder is adapted to be rolled over a package moving past the same on a conveyor, for instance, to apply the imprint to the package.

Heretofore, various expedients have been employed for installing such printing bands on the printing cylinders. In the case of wooden printing cylinders, staples, tacks, or like fasteners were employed. In the case of wooden and metal printing cylinders, metal straps or clamps have been utilized which were expensive and required the printing bands to be made with sufficient clearance along at least one edge thereof to permit the strap or clamp to be engaged around the printing band without interfering with the type formations thereof. Also, where such metal straps or clamps have been used, it was generally required to reinforce the back of the printing band and this was done by means of thin strips of brass laminated to the back of the printing band over which the straps or clamps were engaged. Since it is necessary and frequently desirable to change the printing band or replace the band with another bearing different type formations, previous methods of mounting the printing band on the printing cylinder were unsatisfactory, for various reasons. Such fastening means as staples and tacks penetrated the printing band causing weakened areas which eventually resulted in rendering the printing band useless. The metal straps and clamps were cumbersome and expensive, although they did permit the printing band to be removably mounted on the printing cylinder. In order to obtain a removable installation for the band where adhesives were employed to mount the band, it was necessary to use a pressure sensitive adhesive which had to be protectively covered in some manner after the printing plate was removed from the cylinder. In the case of permanent-types of adhesives, the printing band could not be removed from the cylinder after its initial installation so that the printing cylinder and band had to be stored together for future use.

Accordingly, it is a major object of the invention to provide a rubber printing band of the character described which is characterized by a construction capable of successfully eliminating the foregoing disadvantages.

A primary object of the invention is to provide an elastic printing band of the character described having novel hook means secured to opposite ends of the printing band, said hook means being oriented one relative to the other, when the band is installed on the printing cylinder of a printing machine to enable cooperative interengagement thereof for mounting the printing band on the printing cylinder, the normal length of the printing

2

band being slightly less than the circumference of the printing cylinder whereby the printing band must be stretched slightly for engaging said hook means one with the other, said hook means thereafter being retained in their cooperative engagement, one with the other, by means of the tension of the printing band on the cylinder.

Another object of the invention is to provide an elastic printing band of the character described comprising, a strip of rubber having printing type molded upon one surface thereof and a pair of opposite free ends, and a hook member secured to each of said free ends, each of said hook members having a bight portion which is in reversed relationship relative to the bight portion on the opposite end of the printing band when the printing band is mounted on the printing cylinder of a printing machine whereby the hook members are cooperatively engageable for mounting the printing band on the printing cylinder under tension, said hook members each comprising a curved strip of thin metal vulcanized to said band.

Other objects of the invention reside in providing a printing band of the character described which is economical to manufacture and use; which can be used repeatedly without damaging the printing band or weakening the same; and which is simple and easy to install and remove.

The foregoing and other objects of the invention will become apparent as the description thereof ensues. A preferred embodiment has been described in detail in the specification and illustrated in the accompanying drawing. It is contemplated that minor variations in the construction and arrangement of parts thereof may occur to the skilled artisan without departing from the scope or sacrificing any of the advantages thereof.

In the drawing:

FIG. 1 is a perspective view of a printing cylinder having the printing band embodying the invention in position curved around the hub of the cylinder preparatory to installing said printing band thereon.

FIG. 2 is an enlarged fragmentary sectional view taken vertically through one end of the printing band and showing the same prior to vulcanizing of a hook member thereto.

FIG. 3 is an enlarged fragmentary sectional view similar to FIG. 2 but after vulcanization of the hook member to the printing band.

FIG. 4 is a fragmentary sectional view through the printing band installed on the printing cylinder of FIG. 1 and along a plane transverse to the cooperatively engaged hook means.

The elastic printing band embodying the invention is formed in a conventional manner. In its normal flat condition, the thickness of the band may be slightly greater than when stretched and mounted on the cylinder of a printing machine. As an example, when stretched, the band may be approximately 0.125 of an inch thick, plus or minus 0.002 of an inch. This dimension is from the bottom surface of the band to the face of the type formations on the band. Dimensions may vary within suitable limits in this respect for conformation with the printing cylinder used.

Referring now to the drawing, the conventional printing cylinder of a printing machine is represented generally by the reference character 20 and the elastic printing band embodying the invention which is to be mounted on the cylinder 20 is designated generally by the reference character 22. The printing cylinder may be the general type used in flexographic printing machines for printing code data, flavor information and the like on packages, such as cellophane bags, wrappers or the like.

The cylinder 20 has a cylindrical hub or drum 24 which is secured between a pair of identical parallel end plates or discs 26 and 27. The diameter of each of the discs

26 and 27 is slightly larger than the external diameter of the hub 24 and the perimetric edges 28 of the discs preferably are serrated to provide desired traction surfaces when the cylinder is rolled over a package during imprinting. The hub or drum is freely mounted rotatable on a shaft 30 by means of which the entire assemblage 20 is mounted on a printing machine. As seen in FIG. 1, one end of the shaft 30 protrudes axially outward of the disc 26 and although not shown, the opposite end of the shaft likewise protrudes outwardly of the disc 27, the printing cylinder being mounted in the printing machine by means of said protruding end portions of the shaft 30.

The printing band is comprised of a flat, elastic strip 32 of rubber of substantially rectangular configuration having type formations 34 molded or otherwise formed on the upper surface 36 thereof. The normal length of the strip 32 in flat condition, is somewhat less than the arcuate length of the circumference of the drum 24. The width of the band 22 is selected to permit accommodation of the band around the drum between the flanges 26 and 27. The band 22 has a pair of opposite free ends 37 and 38 and the cooperating hook means for mounting the band 22 on the drum are secured to the bottom surface 39 of said strip adjacent said free ends.

Said hook means comprise a pair of thin, somewhat rigid, plates or strips 40 and 42. Said strips are formed of metal, such as brass, approximately .010 of an inch thick and substantially equal in width to the width of strip 32. Each of said hook members 40 and 42 is secured to the bottom surface 39 by a suitable adhesive or cement, vulcanizing or the like at a location adjacent a free end of said strip 32. The hook members each protrude outwardly beyond the free end of the strip adjacent which it is attached, the protruding portion of hook member 40 being designated 44 and the protruding portion of hook member 42 being designated 46. Each of said protruding portions is reverse-bent at the free extremity thereof to provide the hooks 48 and 50 respectively, which extend along the entire width of the hook member on which each is formed parallel to and spaced from an adjacent free end of the band. It should be appreciated that in the flat condition of the band 22, that is, prior to mounting same on the printing cylinder, the hooks 48 and 50 open one toward the other. However, said hooks are oriented in reverse relationship, one relative to the other, that is, the hook 48, as seen in FIG. 2, faces toward the upper printing surface of the band whereas the hook 50 is formed in the opposite direction, that is, facing away from the printing surface of the band 22.

In the normal flat condition of the band 22, the length of the band between the opposite extremities 51 thereof, is less than the arcuate length of the drum 24. Consequently, to install the band on said drum, it is necessary to stretch the band 22 in the direction of the length thereof, so that the hooks 48 and 50 can be engaged. This is further apparent from the reverse-bent formations, facing one toward the other, so that edges 51' are spaced apart a distance less than extremities 51 in the flat condition of the band.

When the band 22 is rolled to fit around the hub 24, the pair of hooks 48 and 50 are oriented in reverse relationship one relative to the other, so that when the band 22 is slightly stretched, the hook 50 can be arranged overlying the hook 48. When the band 22 is released, the hooks 48 and 50 automatically are interengaged, the hooks being retained cooperatively engaged together by the tension of the band 22 to hold the band on hub 24.

The plates 40 and 42 are provided with a curvature substantially matching the curvature of the hub so that in the installed position of the band, said plates lie flat upon the hub surface. The curvature described may be formed during the securing of the plates to the band or subsequent thereto. Likewise, the hook formations 48 and 50 may be formed either prior to or after the securing of the plates 40 and 42 to the band. The

portion 46 has a small bend 53 therein which permits hook 50 to lay flat on hook 48 in their interengagement.

Preferably, the plates 40 and 42 are joined to the underside 39 of the band by conventional vulcanization methods, using such agent 52 as shown sandwiched between the plate 42 and band 22 in FIGS. 2 and 3. In FIG. 2, there is shown one end of the printing band just prior to vulcanization of the plate 40 thereto. Here, the hook formation 48 is already formed. In FIG. 3, the structure is shown subsequent to the vulcanization process in which a combination of heat and pressure is used to join plate 40 to end 37 of the band. The plate 40 is provided with the desired curvature after the vulcanization process, and, also, the bottom surface of plate 40 is secured flush with the undersurface 39 of the band by reason of such vulcanization.

Referring to FIG. 4, the thickness of the hooks 48 and 50 when engaged is such, that they do not protrude beyond the serrated edges 28 so as to interfere with the rolling action of the cylinder during printing. The type formations, of course, protrude slightly beyond the serrated edges 28 after stretching of the band, so that they can apply an imprint during rolling of the cylinder 20 over the article to be printed.

To remove the band 22 from its installed position upon the hub 24, the band is stretched slightly to disengage the hook formations 48 and 50. This enables quick changes of the band to be made, which is an important advantage where many changes of a printing band are required by the user. For instance, many businesses have numerous different products of their line which require different imprinting. Further, the user may wish to imprint a certain number of one product and then, switch to another product, etc. The simple quick-change advantage of the invention enables this to be done economically and expeditiously so as to give the user greater flexibility in his printing schedules. Further, the rapid change permitted for the band substantially eliminates the problem of the ink on the ink roller drying during the rapid change-over period. Such an ink roller is conventional to apply ink to the type faces of the band.

It is believed that this invention, its mode of construction and operation, and many of its advantages should be readily understood from the foregoing without further description, and it should be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the specific details are nevertheless capable of wide variation within the purview of this invention as defined in the appended claims.

What is claimed and desired to be secured by Letters Patent of the United States is:

1. A printing band having type formations on the upper surface thereof adapted to be removably mounted around the hub of a printing cylinder said band comprising, a single, normally relaxed flat elastic strip of rubber carrying said type formations and having a pair of opposite free ends, hook means secured to and protruding outwardly of each of said free ends, said hook means being oriented in reverse relationship one relative to the other in the normal relaxed condition of the strip, and the normal unstressed length of the band between the respective bights of said hook means in the relaxed condition thereof being less than the circumference of the hub whereby to require stretching of the rubber strip to permit cooperative engagement of said hook means for mounting the band entirely around the circumference of the hub with the entire strip engaged on the circumference of the hub, said band remaining so engaged on the hub, under tension so as to retain said hooks engaged.

2. The printing band as described in claim 1 in which said hook means comprise strip members secured to the bottom surface of said band adjacent each of the free ends thereof, each strip member having a portion thereof protruding beyond the adjacent free end of the band with

5

said portion having a reverse-bent formation along an entire edge thereof.

3. The printing band as described in claim 2 in which said strip members each have a curvature approximating the curvature of the hub.

4. The printing band as described in claim 2 in which the strip members are vulcanized to the band.

5. A printing band as described in claim 1 in which said hook means are substantially coextensive with the width of the band.

6. A printing band as described in claim 2 in which one of said strip members has a bend in said protruding portion thereof for permitting said hook means to be engaged flat, one on the other, on the curved circumference of said hub.

7. A printing band as described in claim 1 in which said type formations protrude beyond said engaged hook means on the hub.

8. A rubber printing band adapted to be removably installed on the cylindrical drum of a printing cylinder having annular end flanges protruding beyond the circumference of said drum, said band comprising, a normally flat unstressed elongated strip of rubber having type formations molded on the upper surface thereof, said strip having a pair of opposite free ends, hook members secured to the bottom surface of said strip and substantially flush therewith, said hook members situated adjacent each of said free ends with the bight of the hook protruding outwardly of each of said free ends and extending substantially the entire width of said strip each of said hooks having its respective bight portion thereof

6

oriented in reverse relationship, one relative to the other, in the flat condition of said strip, one of said hook members further having a bend in said protruding portion thereof for permitting said hook members to be engaged flat, one on the other, on the curved circumference of said hub, the normal unstressed length of said strip, being selected to be less than the circumference of said drum whereby the strip is required to be stretched to cooperatively engage said hook members for mounting the stressed strip and said hook members directly on the drum and entirely around said circumference of said drum with said type formations protruding beyond the perimeters of the flanges, and the thickness of the engaged hooks on said drum circumference being less than the difference between the diameters of said drum and said flanges.

References Cited by the Examiner

UNITED STATES PATENTS

851,049	4/07	Wood	101—401.1 X
1,071,626	8/13	Pannier	101—376
1,093,831	4/14	Cornwall	101—368
1,101,565	6/14	Rice	101—376 X
1,451,204	4/23	Chisholm	101—375
2,382,945	8/45	Trafton	24—16
2,685,129	8/54	Myers	101—375 X
2,771,031	11/56	Knapp	101—415.1

ROBERT E. PULFREY, *Primary Examiner*,

DAVID KLEIN, *Examiner*,