United States Patent

[11] 3,555,948

[72] Inventor **Carl A. E. Olson**
59 Vine St., East Providence, R.I. 02914

[21] Appl. No. **780,130**
[22] Filed **Nov. 29, 1968**
[45] Patented **Jan. 19, 1971**

[54] **ROTARY CUTTING MEANS FOR COLLATING MACHINE**
4 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **83/117,** 83/346
[51] **Int. Cl.** **B26d 1/36**
[50] **Field of Search** 83/117, 116, 346, 347, 678, 663

[56] **References Cited**

UNITED STATES PATENTS

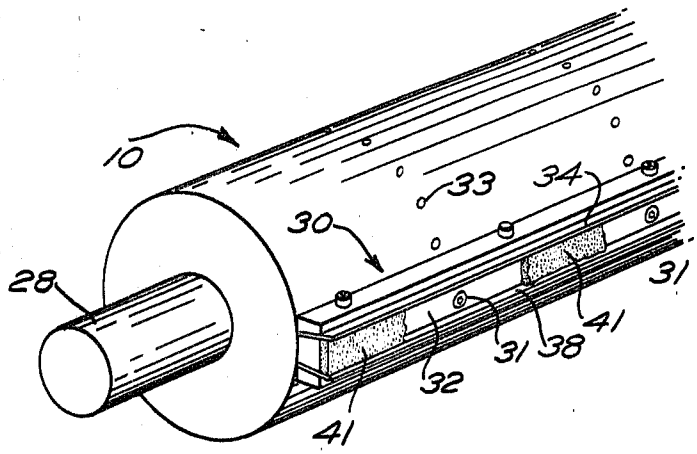
1,363,526	12/1920	Malm	83/117
1,814,867	7/1931	Swift, Jr.	83/117
2,522,154	9/1950	Asmussen	83/117
3,128,663	4/1964	Dovey	83/346X
3,186,274	6/1965	Winkler et al.	83/117X
3,277,756	10/1966	Des Jardins et al.	83/346X

FOREIGN PATENTS

701,501	1/1965	Canada	83/347

Primary Examiner—Frank T. Yost
Attorney—Barlow & Barlow

ABSTRACT: A rotary cutter for use in a collating machine which rotary cutter may be adjusted to accurately cut the web coming from the collating machine to the size of the form that is printed on the web without the need for any further operation on the printed material, such as trimming or the like.



PATENTED JAN 19 1971

3,555,948

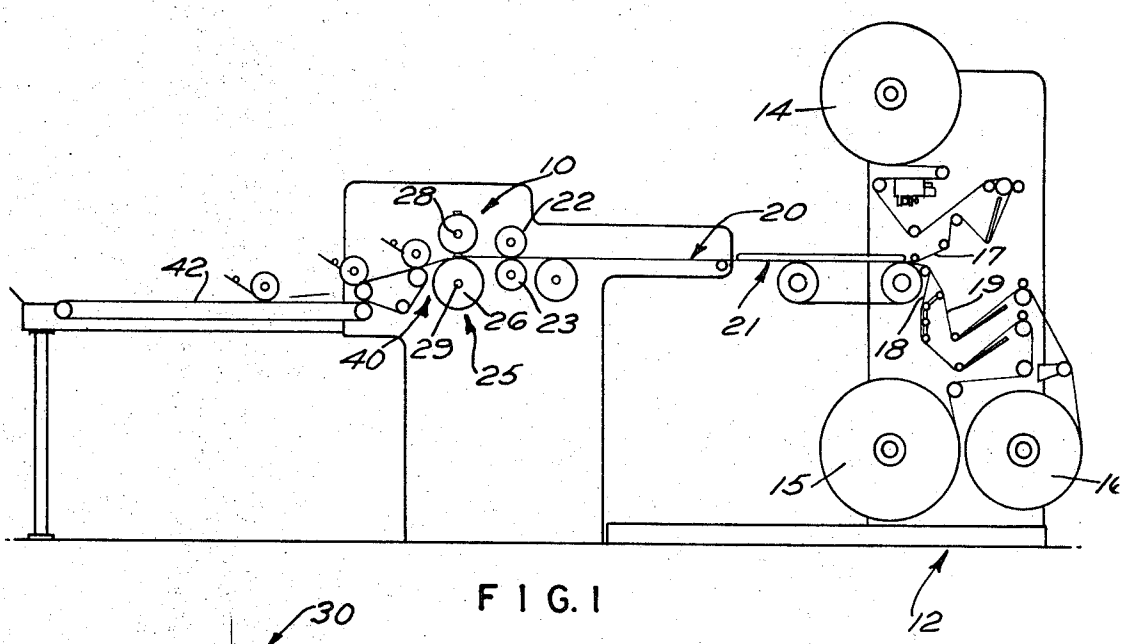


FIG. 1

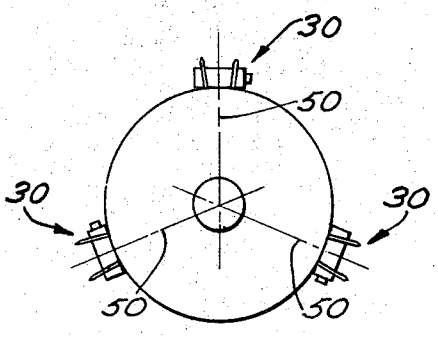


FIG. 3

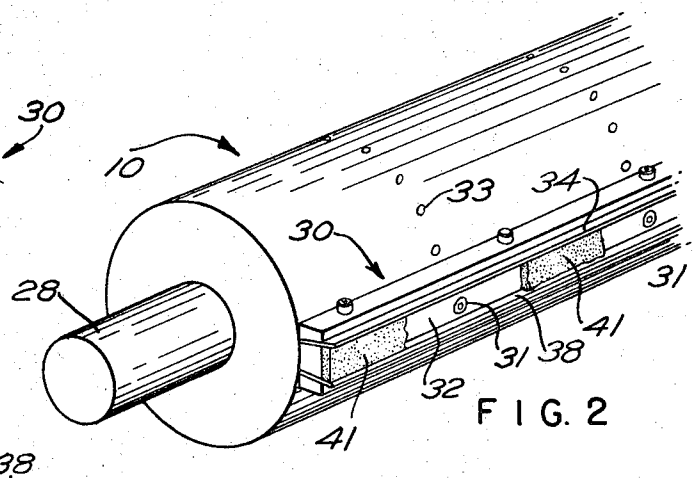


FIG. 2

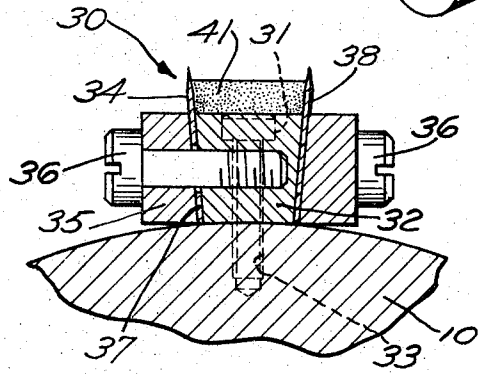


FIG. 4

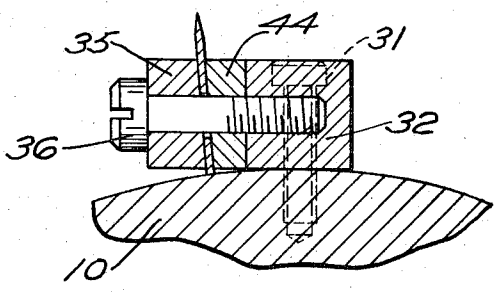


FIG. 4A

INVENTOR.
CARL A. E. OLSON
BY

Barlow & Barlow
ATTORNEYS

ROTARY CUTTING MEANS FOR COLLATING MACHINE

BACKGROUND OF THE INVENTION

Business forms and the like are normally printed on a web as passed through high-speed rotary printing machines, the web being rolled up on cylindrical rolls with the printed material thereon appearing in a certain repeat pattern. The repeat pattern is governed by the circumference of the rotary web press which as found in industry is a standard at 17 inches. Thus, if a form is to be produced that is 5 inches long, only three such forms can be printed on one pass of the rotary web press and certain spacing will therefore occur between the forms of two-thirds of an inch. Most of the forms printed in this fashion are multiple forms, that is to say three or more carbon copies are made from a standard form and thus a number of identical cylindrical rolls of printed material are produced usually on different colored paper. The cylindrical rolls of printed materials are then passed on to a collating machine where carbon is inserted between different webs of the printed material and it has been usual, as the webs are joined together and pass into their justifying stage, to be severed by a rotary cutter. The rotary cutters that have been used in the past have consisted of a single knife or perhaps two knives mounted within recesses in cylinders and secured therein by nuts and bolts. The design of these cutting cylinders have long been known and are exemplified in U.S. Pat. No. 877,010 of 1908. Since the printed forms have to be made to a particular size and cannot be accurately cut, unless perchance they are 8½ inches long which divides equally into the 17-inch repeat of the rotary web press drums, an additional operation is necessary by stacking the forms and putting them into a vertically reciprocable cutter. When this is done, it will be realized that carbon paper is in between the leaves of the forms and as the cutter blade descends the carbon will deposit itself onto the layer below and leave a carbon edge showing where the form was cut. This is an undesirable result in the production of forms and the present invention obviates this by providing a cutter drum which can be readily utilized with any size form and will cut the necessary scrap between the repeats of the printing material as the same passes out of the collating machine.

SUMMARY OF THE INVENTION

This invention relates to a cutter for use with a collating machine that uses printed material from a rotary web press printing machine or the like and includes an accurately ground drum which has mounted on the surface thereof radially extending cutter knives which knives are secured to mounting blocks that in turn are secured to the drum of the cutter on its outer periphery. Accurately drilled and tapped holes are provided on the periphery of the cylinder, which holes are spaced around the circumference of the cylinder in positions which will mount the blocks that support the cutting knives at positions to accommodate 3-inch, 4-inch, 5-inch and the like-sized forms, and are also spaced about the circumference distances to accommodate not only the standard 17-inch circumference printing roll press but also the 14-inch and the 22-inch circumference roll presses that are sometimes found used in the printing industry.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view mostly diagrammatic illustrating a typical collating machine and showing only one end section thereof together with the mechanism for feeding the webs to the cutting station;

FIG. 2 is a perspective view of the end portion of the cutter of the instant invention;

FIG. 3 is a view mostly diagrammatic illustrating the various positions which the cutter blades may assume;

FIG. 4 is an enlarged sectional view of the portion of the cutter illustrating the manner in which the knives are attached to the cylindrical body; and

FIG. 4A is a sectional view similar to FIG. 4 showing one cutter.

FIG. 4 is an enlarged sectional view of the portion of the cutter illustrating the manner in which the knives are attached to the cylindrical body; and

FIG. 4A is a sectional view similar to FIG. 4 showing one cutter.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the form of the invention that has been chosen for the purposes of illustration in the drawings, the rotary cutter of the invention **10** is shown as embodied in a collating machine which is made up of a plurality of web intermediate units generally designated **12**. Some of the intermediate units contain rolls of printed paper webs **14** and **15** for example, and a roll of carbon paper **16** that are interleaved with the carbon paper web in between the webs from the rolls **14** and **15**. To this end, therefore, the roll **14** has a web **17** emanating therefrom and the roll **15** has web **18** emanating therefrom and the carbon paper roll **16** has a web **19** emanating therefrom. These three are combined in what can be termed a strip of material generally designated **20** that passes over the combining conveyor table generally designated **21** by being fed by rolls **22,23** and to a cutting unit generally designated **25**. Here the cutter roll **10** of the instant invention is mated with an anvil cutting cylinder **26** against which the knives of the cutter cylinder **10** are adapted to be pressed to sever the webs.

The cutter cylinder **10** is illustrated in the drawings and more particularly in FIGS. **2** and **4** as taking the form of a cylindrical body which is provided with trunnions or a drive shaft such as **28** that is rotatable about an axis parallel to the axis of rotation of the shaft **29** of the anvil cylinder **26**. A knife holder generally designated **30** is secured to the cylinder **10** by means of a plurality of socket head screws **31** that pass through a knife mounting block **32** between its opposite knife-mounting faces and into openings **33** in the cylinder. The surface of the block **32** engaging the cylinder may be arcuate to fit the cylinder. The opposite faces **37** of the block **32** are formed on a radius of cylinder **10**. The knife blades such as **34** are in face to face engagement with face **37** and will be mounted by means of clamping plates **35** and screws **36** so that they extend radially outward from the cylinder. In the illustrated embodiment there has been shown a pair of knives not only the knife **34** but also a second knife **38** that is mounted on the opposite side of the block **32** having a face which is a radial of the cylinder **10**. It is quite common in the industry today to have what is known as snapaway forms that are 7¾ inches in length. As stated before, the usual type of rotary web press printing roll has a circumference of 17 inches. Accordingly, for the production of a number of forms, there will be two repeats per revolution of the printing roll. This means that there will be scrap material to be cut off in order to maintain the proper dimensional shape of the form of 1½ inches. Two cuts have to be made, however, and therefore, ¾ of an inch scrap have to be cut off between each of the forms. Accordingly, it is customary to form the block **32** of such a dimension that the knives **34** and **38** at their cutting edges will be ¾ inches apart, and if two such cutting blocks are placed diametrically opposite each other, it will be readily seen as the forms progress through the cutter of the collating machine, that the scrap or the portion between the forms which is unnecessary in the entire web will be completely cut out and will pass down on the forward side of the cutting arbor as at **40** into a waste area. The ejection of the scrap is assisted by resilient members **41** located between the knives **34**, **38**. Normally so-called trim disposals units are provided on collating machines, and they will suck out the scrap paper and dispose of the same in the usual fashion. In this way, it can be readily appreciated that on the delivery table **42** proper size forms are produced which need only be properly stacked up into shipping containers or banded for shipping as the case might be without any further operation being had thereon to make the same marketable sizewise.

It will be readily appreciated that in many instances it is not necessary to cut out any strip of material to make the forms the proper size. Accordingly, in many instances where forms of 8½ inches length are produced, a single knife only is necessary and in this case a single knife may be mounted such as shown in FIG. 4A, and should any spacing of the knife be necessary to provide a certain point of cutting, a wedge such as **44** may be placed between the mounting block **32** and the pressure plate **35** to accommodate for this size variation. By referring to FIG. **3** it may be seen how a variety of arrangements can be achieved by providing a plurality of holes that are predrilled in the cylinder such as the hole **33** on the cylinder 10. These holes can be prearranged at certain angular positions and knowing, for example, that it is common to produce certain angular positions and knowing, for example, that it is common to produce certain sized forms. For example, a 5-inch form is a common size form, and if a 5-inch form is to be produced, the cutting blades would be oriented generally on the radial lines indicated at **50** in FIG. **3**. These are 120° apart and will make three cuts from a 17-inch rotary web plate with a pair of knives such as illustrated in FIG. **4** that are spaced apart ⅝ of an inch at their cutting edges. Any number of combinations are possible with a mechanism of this configuration, and by properly coordinating the rotary web press printing cylinder with the cutting cylinder of the collating machine, any and all combinations may be possible since in some cases the adjacent forms may be juxtaposed in such a way that only a single cut is required at one point while a double cut is required at another point to remove the waste scrap that is produced by the spacing necessary in order to utilize the 17-inch circumferential dimension of the printing cylinder.

I claim:

1. A rotary cutter for a collating machine having a plurality of rotary web printed rolls with a printed repeat of finite length thereon comprising a cylinder, said cylinder having at least one holder mounted on the surface thereof, said holder comprising a longitudinal axially extending block affixed to the surface of the cylinder, said block having radial face surfaces on opposite sides thereof, a pair of knives affixed to said radial face surfaces to extend radially outwardly from said cylinder, said knives being mounted on said opposite faces of said block to remove from the web the scrap portion thereof, said cylinder having locating apertures about the circumferential surface of the cylinder to locate the holder and means passing through said block to secure said holder in one of said apertures.

2. A rotary cutter as in claim 1 wherein resilient means are located between said knives to assist in ejecting scrap from between them.

3. A rotary cutter for a collating machine having a plurality of rotary web printed rolls with a printed repeat of finite length thereon comprising a cylinder, said cylinder having a plurality of apertures prearranged at certain angular positions around the circumference of the cylinder, said cylinder having a plurality of holders mounted on the surface thereof, said holder comprising a longitudinal axially extending block affixed to the surface of the cylinder by securing means passing through said block and being engaged in said apertures, said block having radial face surfaces on opposite sides thereof, at least one knife affixed to one of said radial face surfaces to extend radially outwardly from said cylinder.

4. A rotary cutter as in claim 3, wherein the radial face surface to which said knife is affixed is the outside radial face of a wedge which may form part of said block wherein wedges of different thickness may be used to provide an additional degree of adjustability in locating a knife circumferentially on the cylinder.