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PERFORATING APPARATUS

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FIG. 1.

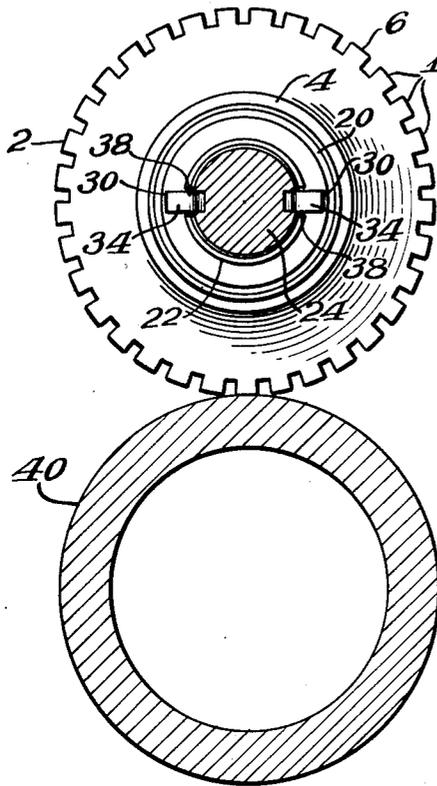


FIG. 2.

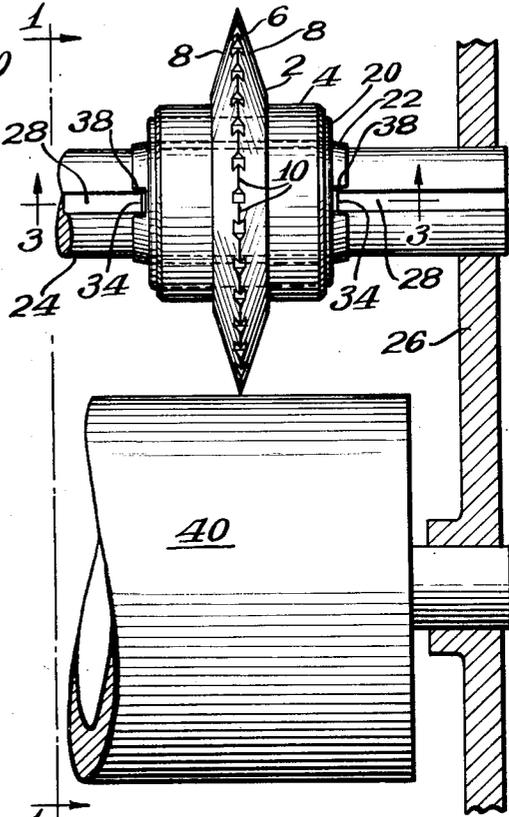


FIG. 3.

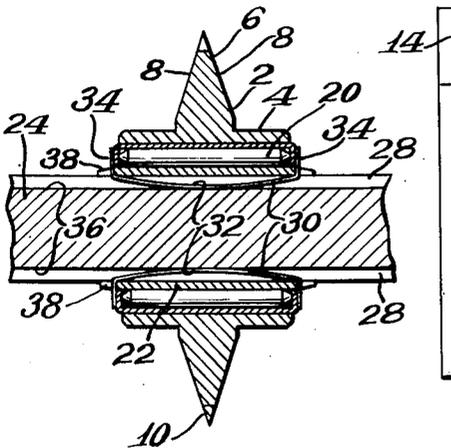
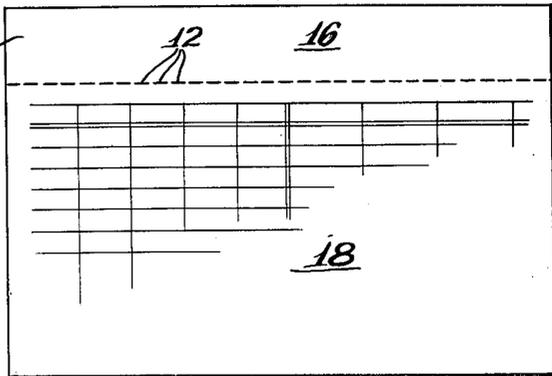


FIG. 4.



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PERFORATING APPARATUS

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3 Claims. (Cl. 308—210)

This invention relates to perforating apparatus adapted to be incorporated in the feed mechanism of a printing press to form a line of perforations across a sheet of paper, such as a record card, prior to the printing operation, and has for an object the provision of a perforating apparatus which is relatively simple and inexpensive in construction and adapted to operate over a long period of time to apply uniform lines of perforations to relatively thin sheet material, such as paper, cardboard, and the like.

Another object of this invention resides in the provision of a perforating wheel formed with radially disposed circumferentially spaced wedge-shape teeth and journaled for rotational movement on a fixed shaft to coact with a driving roll to form a line of perforations across a sheet of paper as the latter moves between the wheel and the roll.

A further object of this invention is to provide a perforating apparatus in which a hardened tool steel perforating wheel coacts with a roll formed of relatively soft metal to form a line of perforations across a paper sheet.

This invention further contemplates the provision of a perforating wheel axially adjustable along a fixed shaft having its axis parallel to the axis of a cylindrical roll, whereby the wheel may be adjustably positioned transversely to the line of travel of sheets of paper being fed to a printing press.

Another object of this invention is to provide anti-friction bearings for the perforating wheel to insure proper engagement of a sheet of paper between the wedge-shape teeth and the periphery of the roll.

Another object of this invention is to provide an improved means permitting adjustment of the perforating wheel axially of its shaft responsive to manual pressure against one side of the wheel.

This invention embodies other novel features, details of construction and arrangement of parts which are hereinafter set forth in the specification and claims, and illustrated in the accompanying drawing, wherein:

Fig. 1 is a transverse sectional view taken along the line 1—1 of Fig. 2, showing a perforating apparatus embodying features of this invention.

Fig. 2 is a fragmentary front elevational view of the perforating apparatus.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a top plan view illustrating a sheet of paper as perforated by the apparatus to form two hingedly connected sections.

Referring now to the drawing for a better understanding of this invention, the perforating apparatus is shown as comprising a perforating wheel 2 having a hub portion 4 formed integral with an annular cutter portion 6 having radially converging side walls 8—8 defining the sides of radially disposed circumferentially spaced wedge-shape teeth 10 which are preferably coextensive in length to form a line of uniform perforations 12 across a sheet of paper 14 as illustrated in Fig. 4. It will be understood that the length of the teeth 10 and the distance between adjacent teeth determines the type of hinge connection joining adjacent sections 16 and 18 of the sheet.

The hub portion 4 of the wheel is bored to receive an anti-friction bearing 20 which is sleeved over a bushing 22 slidably mounted on a shaft 24, the ends of the shaft being secured to side frames 26—26. The shaft 24 is formed with diametrically opposed longitudinal extending

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keyways or grooves 28—28 to receive a pair of elongated resilient keys 30—30 formed from strips of flat resilient spring metal to provide a bowed intermediate portion 32 extending between substantially parallel offset portions 34—34. The bowed portions 32 of the resilient keys are slidably engaged within their respective keyways 28 with their medial portions frictionally engaging the bottom walls 36 of the keyways and their ends engaging the ends of the bushing 22. The offset portions 34 extend outwardly through slots 38 formed in the ends of the bushing 22 to prevent displacement of the keys from between the shaft and bushing and to prevent rotation of the bushing around the shaft.

A cylindrical roll 40 formed of relatively soft metal, such as aluminum, brass, or the like, is journaled at its ends in the side frames 26—26 and adapted to be driven by a conventional power transmission means (not shown) connected to a source of power. The axis of the roll 40 is disposed parallel to the axis of the shaft 24 to insure proper operation of the perforating wheel 2 in different positions throughout the length of the cylindrical surface of the roll.

In the operation of the perforating apparatus, a sheet of paper 14 or the like is guided between the wheel 2 and roll 40 while the latter is being rotated to cause the teeth 10 to successively engage and to form a straight line of perforations 12 across the sheet whereby the sheet is formed with two hingedly connected sections 16 and 18. The cutting edges of the teeth 10 are preferably disposed to lightly contact the cylindrical surface of the roll 40 which is formed of relatively soft metal to minimize dulling of the teeth.

It will be noted that the wheel 2 may be manually moved to different positions axially of the shaft 24 and is frictionally engaged in adjusted position by means of the resilient keys 30—30. To eliminate wear and to minimize frictional resistance to rotational movement about the shaft, the wheel 2 is provided with an anti-friction bearing 20 which is preferably of the Torrington needle type. In applying a line of perforations 12 to record cards, the sharp edges of the teeth 10 cut through the card and the side walls 8—8 of the teeth act to enlarge the perforations and to compress the fibers in the card adjacent the perforations.

While this invention has been shown in but one form, it is obvious to those skilled in the art that it is not so limited but is susceptible of various changes and modifications without departing from the spirit and scope of the claimed invention.

I claim as my invention:

1. In a structure of the character described, a fixed shaft, a wheel journaled for rotational movement on said shaft and comprising a hub portion, said wheel having a bushing sleeved over said shaft and an anti-friction bearing disposed between said hub and said bushing, said shaft having a keyway, and a key formed of resilient strip metal having a bowed portion mounted in said keyway and engaging opposite ends of said bushing to yieldably resist movement of the latter axially of the shaft.

2. In a structure of the character described, a fixed shaft, a wheel journaled for rotational movement on said shaft and comprising a hub portion, said wheel having a bushing sleeved over said shaft and an anti-friction bearing disposed between said hub and said bushing, said shaft having a keyway, and a key formed of resilient strip metal having a bowed portion mounted in said keyway and engaging opposite ends of said bushing to yieldably resist movement of the latter axially of the shaft, the ends of said key being positioned in slots formed in opposite ends of said bushing to engage the latter against rotation relative to said shaft.

3. In a structure of the character described, a fixed shaft, a wheel journaled for rotational movement on said shaft and comprising a hub portion, said wheel having a bushing sleeved over said shaft and an anti-friction bearing disposed between said hub and said bushing, said shaft having a keyway, and a key formed of resilient strip metal having a bowed portion mounted in said keyway and engaging opposite ends of said bushing to yieldably resist movement of the latter axially of the shaft, the ends of said key being positioned in slots formed in oppo-

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site ends of said bushing to engage the latter against rotation relative to said shaft and to engage the anti-friction bearing, bushing and hub against relative axial movement.

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