Feb. 17, 1953 G. KANE 2,628,681

WEB PERFORATING MECHANISM

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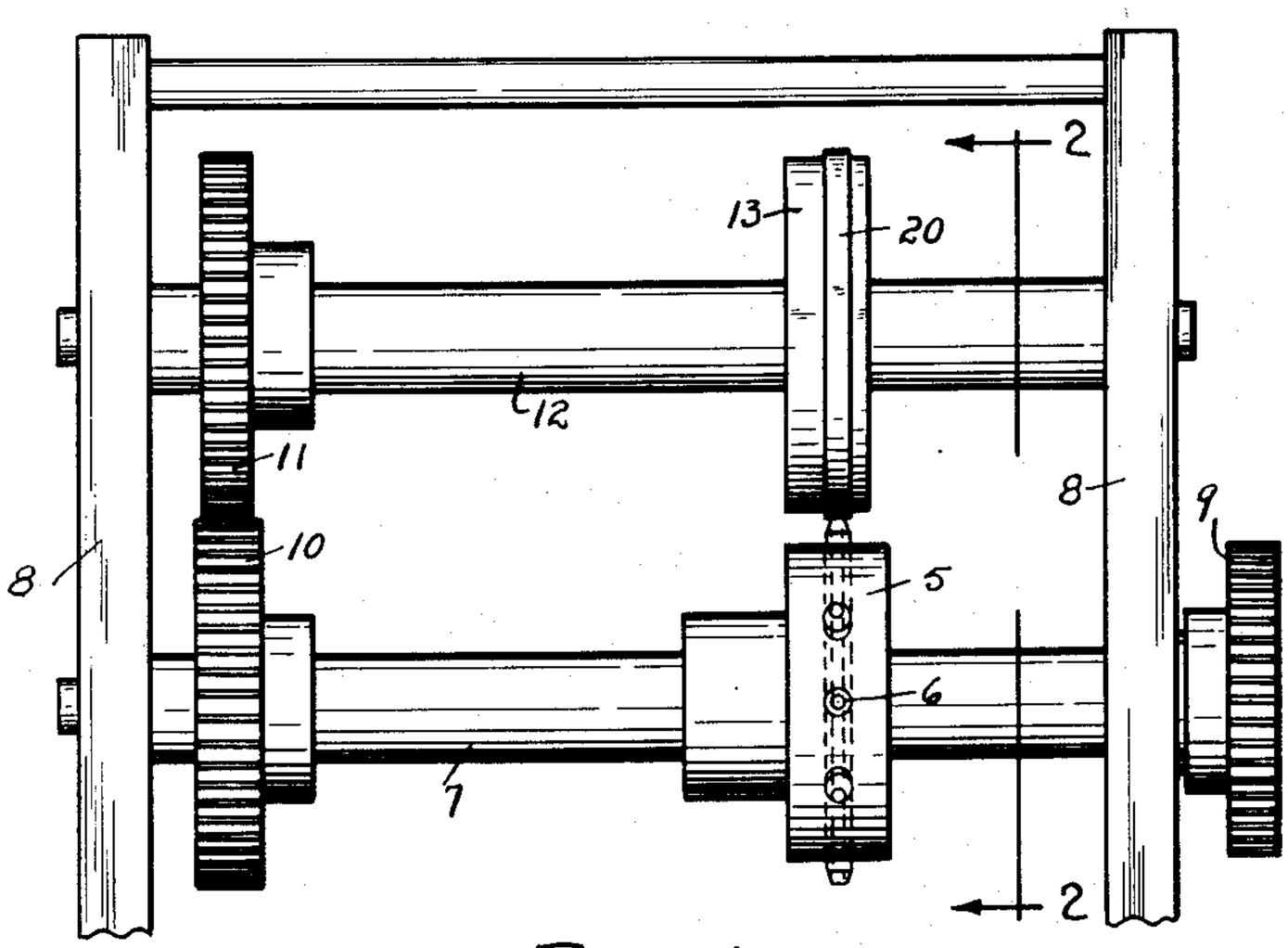

FIG. 1

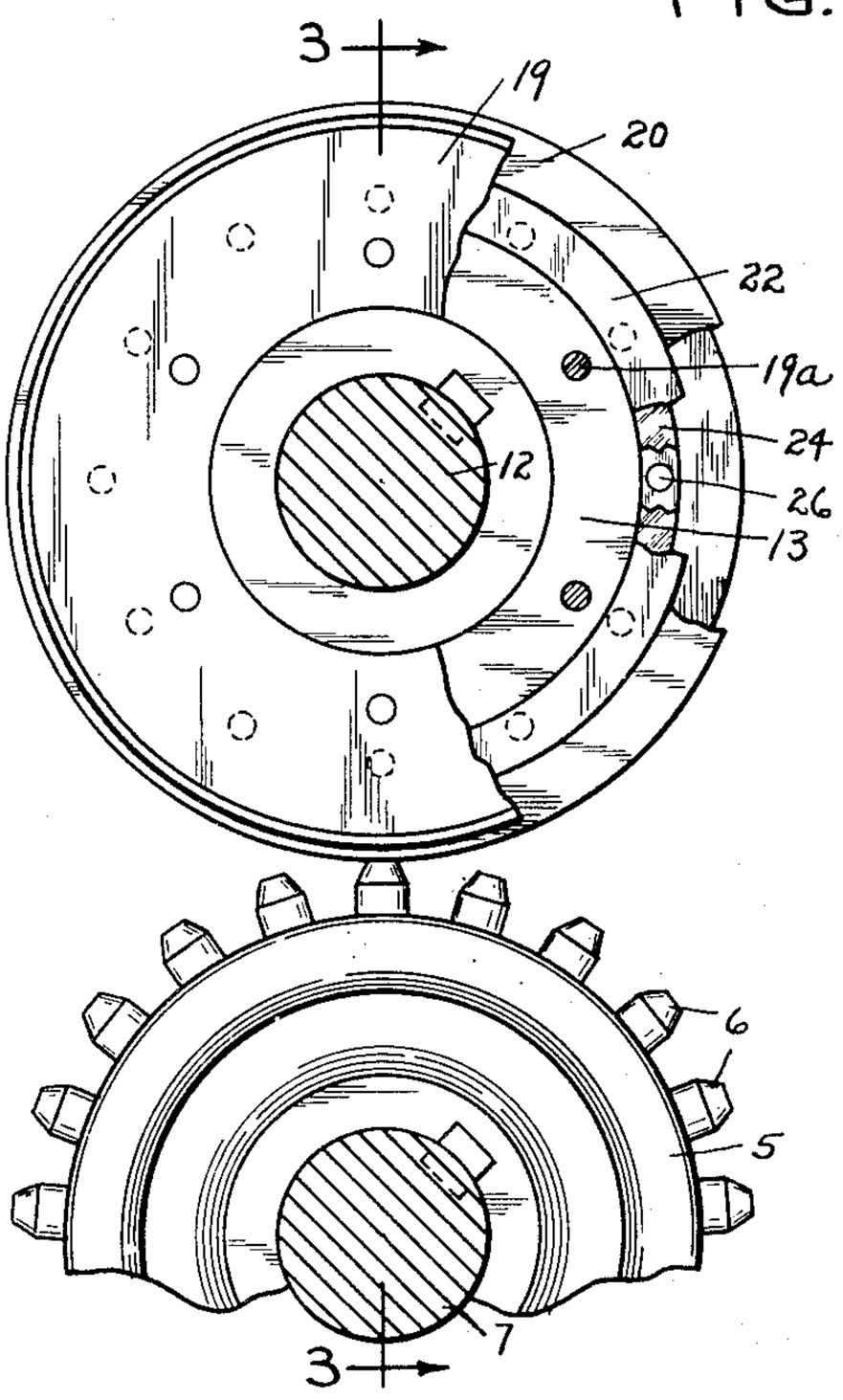

FIG. 2

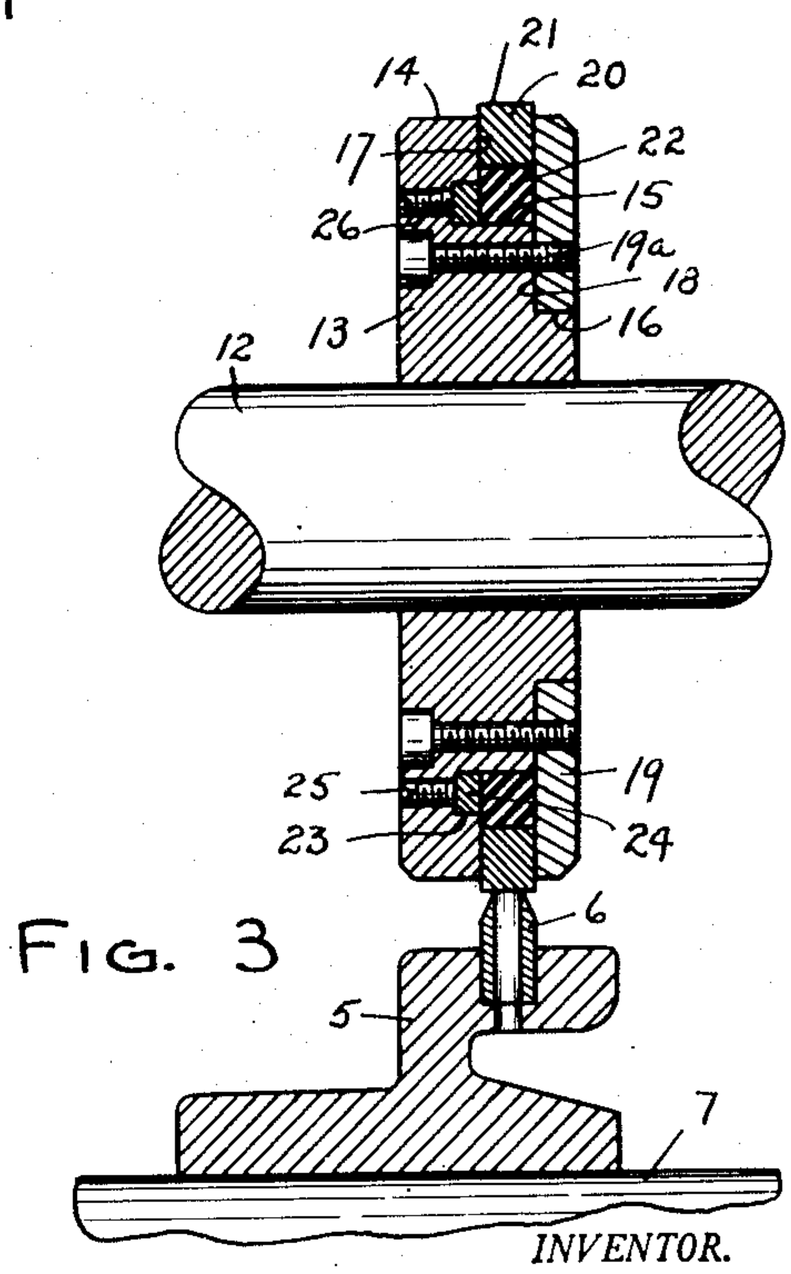

FIG. 3

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WEB PERFORATING MECHANISM

Gideon Kane, Green Bay, Wis.

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2 Claims. (Cl. 164—99)

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The invention relates to web perforating mechanism, that is, mechanism for punching holes at spaced intervals along a web of paper or other sheet material.

Usually the perforating of a continuous web of paper or other sheet material has been accomplished by a rotary punch and a rotary cavity type die with the result that each punch has to aline exactly with its associated die cavity and a very slight misalinement of parts results in punch breakage or in rapid wear of the parts necessitating replacement. The object of this invention is to do away completely with accurately alined and cyclically timed cooperative dies by providing a rotary anvil, for use with a rotary punch, instead of a cavity type die, forming this anvil of metal having a hardened or wear resisting outer surface and backing this anvil with a yieldable cushioning material such as natural or synthetic rubber or other suitable yieldable plastic material which permits slight movement of the anvil during the punching operation.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a front elevation view of perforating mechanism embodying the invention;

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1, parts being broken away;

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

Referring to the drawings, Fig. 1 shows a portion of a web treating machine which may be a printing press or a paper fabricating machine in which the web perforating mechanism is used to perforate the web at spaced intervals so that these perforations may cooperate with parts of the press or machine to secure proper registry of the web for printing, cutting, or other subsequent operations.

A rotary punch roll 5 having radially disposed circumferentially spaced punches 6 mounted therein is keyed to a shaft 7, journalled in a frame 8 of the machine, and carries a drive gear 9 and a gear 10 which meshes with a gear 11 on a shaft 12. The gear 9 is driven by any suitable drive connections with a motor (not shown).

The shaft 12 is suitably adjustably journalled in the frame 8 and has roll or disk 13 keyed thereto which is provided with stepped peripheral faces 14, 15 and 16 providing annular faces 17 and 18. A collar 19 having a flat inner face is mounted to fit over the face 16 and against the flat face 18 to form with the face 17 and the face

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15 an annular groove in the outer portion of which an anvil ring 20 of hardened steel or other suitable metal having a hard or wear resisting outer surface 21 is mounted. The collar 19 is clamped in position by a series of screws 19a extending through radially disposed holes in the disk 13 and having threaded connection with said collar.

Also mounted in the annular groove above described and between the face 15 and the inner side of the ring 20 is a yieldable backing 22 of resilient plastic material such as natural or synthetic rubber. This backing may be formed as a one-piece ring or be built up from a series of segmental pieces.

In order to secure a firm contact of the backing 22 with the ring 20 an annular recess 23 is formed in the roll 13 opening into face 17 in the region of the backing 22 in which a metal ring 24 is slidably mounted so that movement of said ring 24 against the backing 22 will force said backing against the ring 20 and the face 15 and put the backing under an initial compression. For moving the ring 24 a series of set screws 25 are provided mounted in a series of threaded holes 26 extending from an outer surface of the roll 13 to the bottom of the recess 23.

With the above construction, the outer face 21 of the anvil ring 20 is so disposed relative to the cutting edges 27 of the punches 6 that as the sheet or web to be perforated is fed between the punches and the anvil, each punch will cut through the sheet and contact the face 12 and move the ring 20 inwardly slightly to cut out a hole in the paper, this slight movement compensating for the curvature of anvil face axially relative to the cutting edge of the punch.

While not specially shown, it will be understood that the journals for the shaft 12 carrying the anvil ring are adjustable so that the ring 20 may be moved out of punch contacting position during threading through operations of the web.

With the above arrangement the punches 6 do not have to be timed relative to a cooperative die member to get the proper punching action. All that is necessary is to adjust the anvil 20 in proper relation to the punches 6 to secure efficient action of the punch.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. In perforating mechanism for a traveling web of sheet material, the combination of a pair

of rotatable rolls between which the web passes, one of said rolls provided with radially disposed punches, the other roll having a peripheral groove, an anvil ring mounted in the outer portion of said groove and capable of movement relative thereto and provided with a wear resisting punch contacting surface, a resilient plastic backing filling the remainder of the groove and in contact with said anvil ring, adjustable plate means mounted in said last named roll at one side of said groove and capable of movement into said groove and acting on an abutting side surface of said plastic backing for placing said backing under an initial compression load to bring it into firm peripheral contact with the entire inner side of said ring.

2. The structure as defined in claim 1, wherein the means for placing the plastic backing under an initial compression load comprises a metal ring in an annular recess communicating with a side of said groove and bearing against the entire

area of said backing abutting said metal ring at this side to force said backing into firm contact with the entire inner side of said ring and the bottom of the groove, and means for moving said metal ring into compressive contact with said backing.

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