

[54] **ROLL-FORMING MACHINES**  
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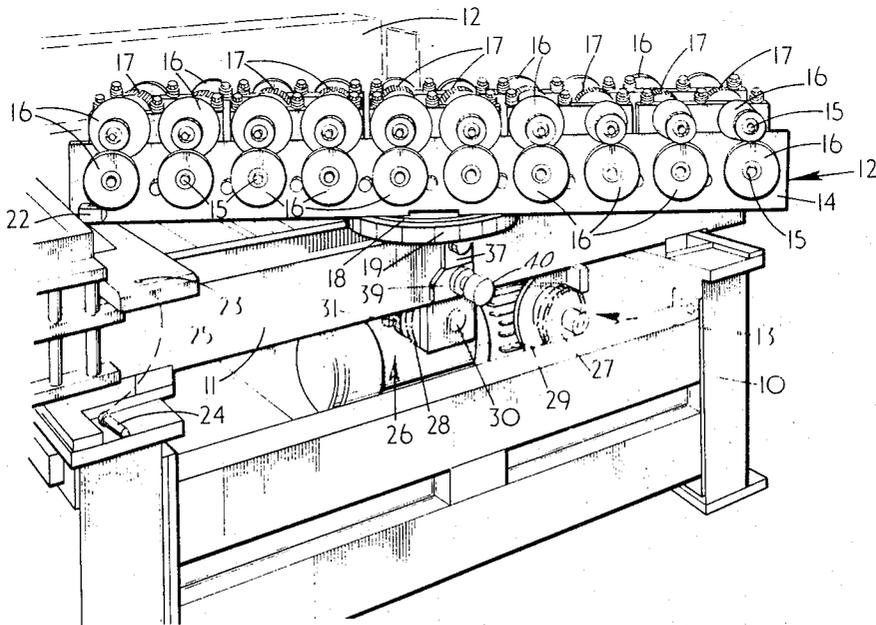
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**ABSTRACT**

A roll-forming machine comprising a roll-forming head including shafts or spindles for mounting two series of rolls, the head being adjustable so that the shafts or spindles can be arranged to permit either series of rolls to be brought into an operable position.

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**8 Claims, 4 Drawing Figures**





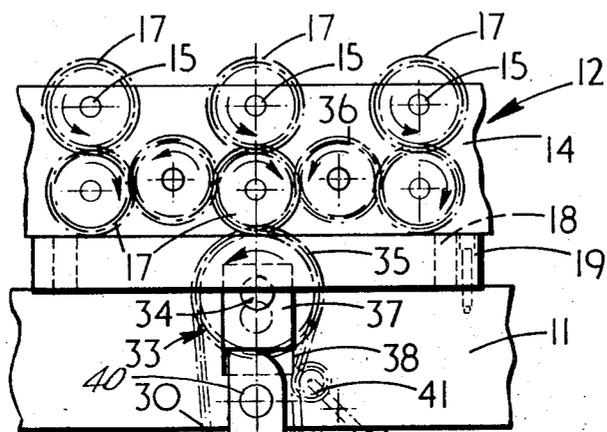


FIG. 2

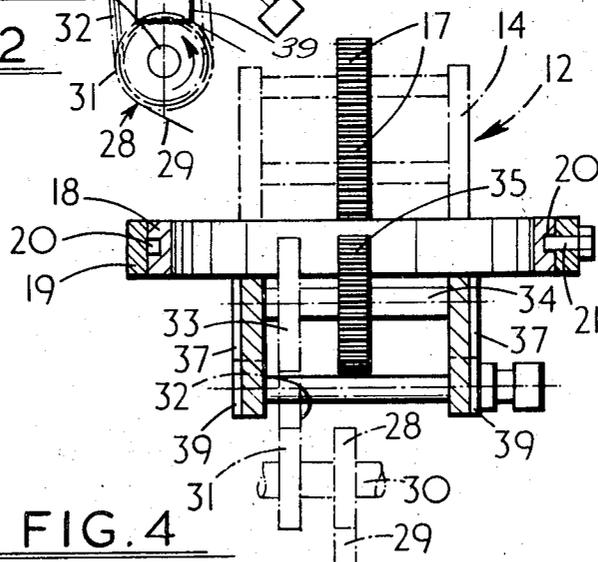
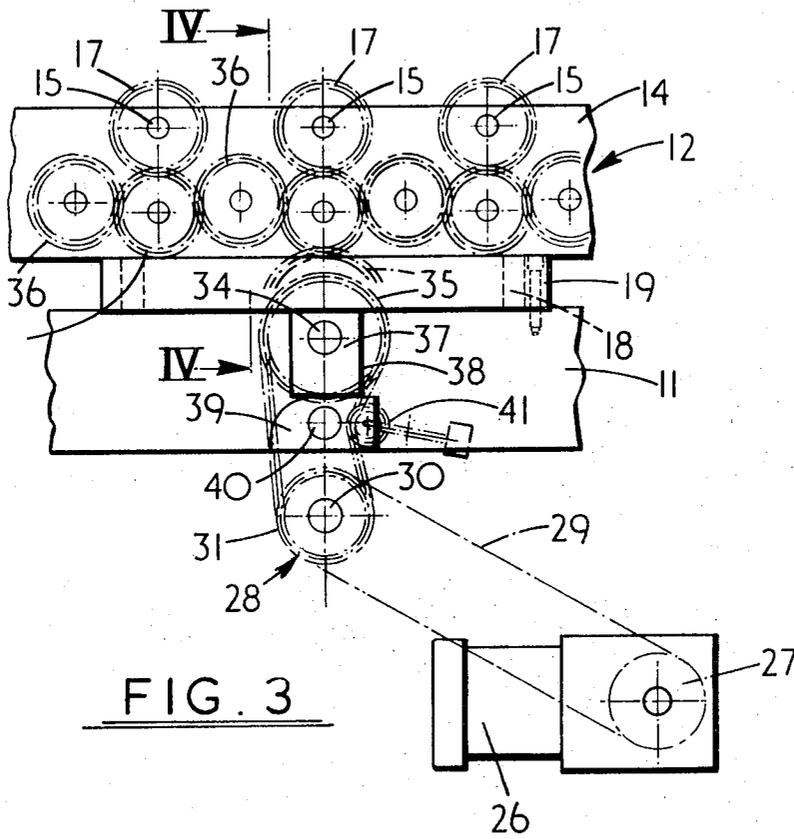


FIG. 4



## ROLL-FORMING MACHINES

This invention relates to roll-forming machines and particularly to roll-forming heads for such machines.

Known roll-forming machines include heads which comprise rolls configured to form the required shapes in panels and the like. These machines, however, present a major disadvantage in that, in order to change the shape imparted to panels passing through the machine, it is necessary to remove and replace the rolls, which can take many man hours and require the machine to be out of use for a considerable time.

It is an object of the present invention to obviate or mitigate this disadvantage.

According to the present invention there is provided a roll-forming machine comprising a roll-forming head including shafts or spindles for mounting two series of rolls, the head being adjustable so that the shafts or spindles can be arranged to permit either series of rolls to be brought into an operable position.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawing, in which:-

FIG. 1 is a fragmentary perspective view of a roll-forming machine incorporating a roll-forming head according to the present invention;

FIG. 2 is a fragmentary side view showing the drive to the rolls;

FIG. 3 is a view corresponding to FIG. 2 showing the drive disconnected to permit adjustment of the head; and,

FIG. 4 is a section of the line IV—IV of FIG. 3.

There is provided a roll-forming machine for imparting a shape to two parallel edges of a panel. This machine comprises a base 10 supporting two laterally-spaced sub-bases 11 each of which supports a roll-forming head 12, and means 13 for driving the rolls of the heads 12.

Each head 12 comprises a frame 14 supporting a series of pairs of parallel, vertically-spaced shafts or spindles 15 which traverse the frame 14. A forming roll 16 can be attached to either end of each shaft or spindle 15, the roll 16 at one end of each shaft or spindle 15 being of different shape from that at the other end.

The shafts or spindles 15 are driven by gearwheels 17 disposed intermediate the ends of the shafts or spindles 15 centrally of the frame 14. Each forming head frame 14 has a ring 18 fixed thereto at its center this ring being of diameter just sufficient to fit inside a ring 19 fixed to the corresponding sub-base 11 of the machine. An annular groove 20 on the outer edge of the inner ring 18 is engaged by a grub screw 21 passing through the outer ring 19. Thus the forming head 12 may revolve on the sub-base 11 as the ring 18 turns inside the ring 19.

To secure the head 12 in the desired operating position, the head 12 at one end is provided at each side with an apertured block 22 adapted to be aligned with an aperture 23 on its sub-base 11, a locking pin 24 being secured by a chain 25 to the sub-base 11 and being adapted to pass through the apertured block 22 and aperture 23 to secure the head 12 in position.

The drive to the rolls 16 of each head 12 is from a motor 26 via chain wheels 27 and 28 and a chain 29, which chain transmission is central to the sub-frame 11. The chain wheel 28 is fast on a spindle 30 which mounts another chain wheel 31 on the inner side of the

sub-frame 11, which chain wheel 31 drives via a chain 32 a further chain wheel 33 fast on a spindle 34 parallel with the spindle 30. A gear wheel 35 is fast on this spindle 34 centrally of the ends thereof and meshes with the central lower gearwheel 17. It is to be noted that the lower gearwheels 17 of each head 12 are drivingly interconnected by idler gearwheels 36.

The spindle 34, chain wheel 33 and gearwheel 35 are vertically adjustable as an assembly and for this purpose are carried by a block 37 at each side of the sub-frame 11, which blocks 37 are vertically slidable in slots 38. A cam 39 engages each of the blocks 37 and is rotatable by a handle 40.

In one position of the cam 39 (FIG. 2), drive is imparted to the gearwheels 17, 35, while in another position of the cam 39 (FIG. 3), the assembly 33, 34 and 35 is lowered and the drive is disconnected.

When it is desired to change the shape to be imparted to a panel passing through the machine, the heads 12 may be revolved to present the other forming rolls to the panel. The assembly 33, 34 and 35 is lowered, the chain 32 being held taut by a spring loaded jockey 41, the head 12 is revolved, pins 24 are placed in position to hold the head 12 stationary, and the assembly 33, 34 and 35 is lifted to engage the drive of the head.

In such a roll-forming machine, one of the heads is conveniently adjustable laterally. This is achieved by having its sub-base 11 slidable laterally, the chain-wheel 31 and 33 sliding over their spindles to which they are keyed as the sub-base is moved.

It will be appreciated that either of the roll-forming head 12 may be easily removed and replaced by unscrewing the grub screw 21 in the outer ring 19 and lifting the head 12 off the sub-base 11.

Thus, while one set of rolls is being used, another may be set up and the shape imparted to the panel changed with minimal loss of machine time and man hours.

We claim:

1. A roll-forming machine comprising:
  1. a frame;
  2. a roll-forming head detachably supported on the frame and rotatable about a vertical axis;
  3. a series of pairs of parallel vertically-spaced shafts traversing the roll-forming head and each adapted for mounting at each end a forming roll;
  4. a first ring mounted on the frame;
  5. a second ring mounted on the roll-forming head and disposed within the first ring, the rings being coaxial and relatively rotatable and their axis being the axis of rotation of the roll-forming head;
  6. means releasably restraining the rings against axial displacement while permitting relative rotation; and
  7. means for releasably securing the roll-forming head on the frame in a roll-forming position.
2. A machine as claimed in claim 1, in which there are a pair of parallel roll-forming heads, each rotatable bodily relative to the frame to bring the desired series of forming rolls to the operative position.
3. A machine as claimed in claim 1, in which the means for axially restraining the rings is a screw carried by the outer ring for engaging in a circumferential groove formed in the outer circumference of the inner ring.
4. A machine as claimed in claim 1 and further comprising means for releasably securing the roll-forming

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head on the frame, said means comprising a pin adapted for passage through an apertured block in the head and a complementary aperture on the frame.

5. A machine as claimed in claim 1, in which the shafts are rotated by gearwheels, the drive being transmitted to the gearwheels by a movable gearwheel carried by the frame, which movable gearwheel is movable out of mesh when it is desired to rotate the roll-forming head.

6. A machine as claimed in claim 5, in which the movable gearwheel is movable vertically under the action of a rotatable cam.

7. A machine as claimed in claim 5, in which the movable gearwheel is rotated by chain and chain-wheel transmission from a motor.

8. A machine as claimed in claim 1 and further comprising:

- 1. a motor for rotating the shafts and

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2. a transmission means between the motor and the shafts, said transmission means including:

- a. a gearwheel on the lower shaft of each pair of shafts, the gearwheels being in mesh,
- b. a drive gearwheel meshing with one of the shaft gearwheels and carried on a rotatable spindle,
- c. a transmission wheel carried on the spindle,
- d. an endless transmission element between the motor and the transmission wheel,
- e. a carrier means vertically slidable in the frame and supporting the drive gearwheel, spindle, and transmission wheel, and
- f. cam means for moving the carrier means between a position whereat the drive gearwheel meshes with said one of the shaft gearwheels and a position whereat they are out of mesh.

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