Jan. 25, 1949. W. J. CAHILL 2,460,123

PEENING MACHINE

Filed June 21, 1944

FIG. 1

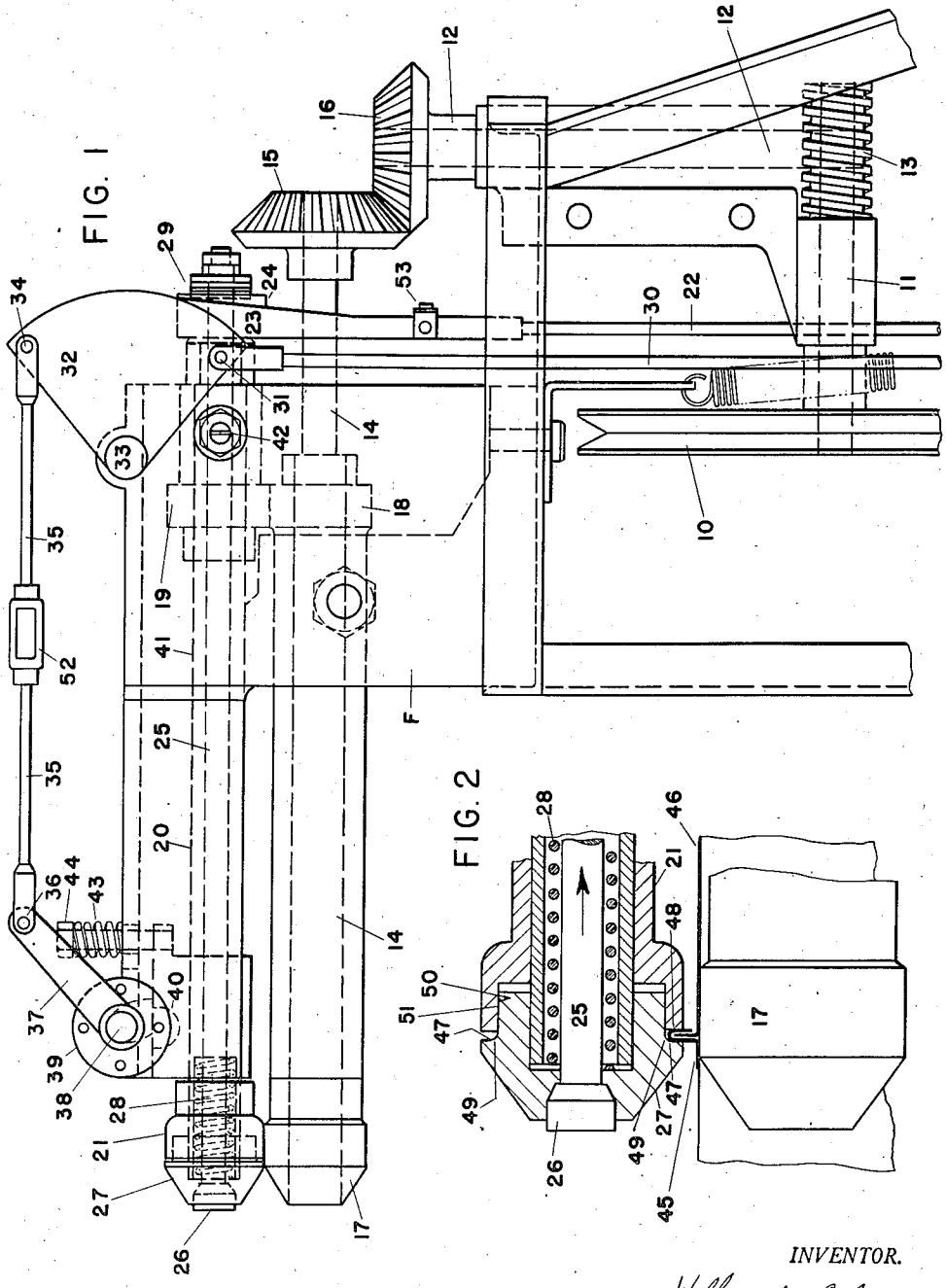


FIG. 2

INVENTOR.

BY William J. Cahill

Herman Bell

Patented Jan. 25, 1949

2,460,123

UNITED STATES PATENT OFFICE

2,460,123

PEENING MACHINE

William J. Cahill, Merion, Pa., assignor to Carrier Corporation, Syracuse, N. Y., a corporation of Delaware

Application June 21, 1944, Serial No. 541,359

3 Claims. (Cl. 113—58)

1

This invention relates to apparatus for forming joints in duct work and more particularly to apparatus for facilitating the speedy seaming of peened joints in round duct work including the peened joints of the sections of an elbow for round duct work.

Prior to the instant invention, peened joints for round duct work have been made by hand and by apparatus requiring relatively highly skilled operators and capable of performing but a specialized operation or operations.

It is an object of the instant invention to provide apparatus for the turning and forming of a peened sheet metal elbow seam which can be operated with a minimum of effort and requiring a minimum of skill on the part of the operator.

It is another object of the instant invention to provide an apparatus of novel design for fabricating a seamed elbow joint for round duct work by turning the preformed edge of one portion of the work over and about the preformed edge of another portion of the work and locking the two edges together to form a joint.

It is still another object of the instant invention to provide an apparatus for forming seamed joints in duct work which will hold the work tightly in a novel manner from the bottom and both sides while the joint is being formed.

Other objects and the nature and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a view in elevation of the apparatus in accordance with the invention; and

Fig. 2 is a fragmentary view partly in elevation and partly in section with the work in place and about to be worked upon by the apparatus.

Referring to the drawings, the pulley 10 which is driven by a motor, not shown, is arranged to drive the horizontal shaft 11 which in turn drives the vertical shaft 12 through the worm 13 on shaft 11 which worm 13 cooperates with a gear at the bottom of shaft 12. Rotating motion is transmitted from the shaft 12 to the shaft 14 through the cooperating bevel gears 15 and 16. The roll 17 is fixedly secured to the shaft 14 and rotates therewith.

Fixedly secured to the rotatable shaft 14 is the gear wheel 18 which meshes with and drives the gear wheel 19 which is fixedly secured to the rotatable shaft 20. Cooperating with the roll 17 is the roll 21 which is fixed to shaft 20 so that it is rotatable therewith.

2

The rod 22, the bottom portion of which is connected to a first foot pedal, not shown, is connected at its top portion to the wedge-shaped cam 23 and is adapted to coact with the wedge-shaped actuating member 24 for causing movement of rotatable shaft 25 to the right, thereby causing the enlarged head 26 on the shaft 25 to bear against roll 27 and bring it towards the roll 21 against the action of the spring 28 which is normally under compression. When enlarged head 26 of shaft 25 comes in contact with roll 27 in engagement with the rotating work pieces, shaft 25 is rotated. Roller bearing 29 serves to reduce friction created by contact with member 24 which might interfere with proper peening of the work pieces.

The rod 30, the bottom portion of which is connected to a second foot pedal, not shown, is pivotally connected at its top portion 31 to the lower end of the rocker element 32 which rocker element is pivotally fixed at 33. The upper end of the rocker element 32 is pivotally connected at 34 to the link 35 at the right end of the link. The left end of the link 35 is pivotally connected at 36 to the outer end of the lever arm 37. The inner end of the lever arm 37 rotates about the shaft 38 to which is fixedly secured the cam 39 which is adapted to coact with the element 40 secured to the upper roll drive shaft assembly 41 which is pivotally mounted at 42. Rotation of the cam 39 in a clockwise direction places the spring 43 under compression and effects movement of the upper roll drive shaft assembly toward the lower drive shaft 14 until the shafts 20 and 25 are parallel to the shaft 14 and the rolls 21 and 27 are adjacent roll 17.

The shafts 11, 12, and 14 are mounted for rotation within a fixed built-up frame assembly F whereas the upper roll drive shaft asembly 41 is pivotally mounted to the frame at 42. The rocker element 32 is pivotally mounted to the frame at 33 and the shaft 38 to which is secured the lever arm 37, is also mounted for rotation on the frame. When there is no pressure on the first foot pedal connected to the bottom of the rod 22, the spring 28 which is under compression will force the shaft 25 to the left so that the enlarged head 26 disengages from the roll 27 so that it is no longer in coacting relationship with roll 21 and the roll 17. Simultaneously, the roller bearing 29 is disengaged and rotation of the shaft 25 may cease. When there is no pressure on the foot pedal connected to the bottom

of the rod 30, the spring 43 which bears at its bottom against the frame, will force the bolt 44 upwardly and carry with it the element 40 and the upper roll drive shaft assembly will be raised from its position shown in Figure 1.

In operating the machine, the elements of work 45 and 46 are located between the rolls 17, 27 and 21, as shown in Figure 2, in such a manner that the vertical inner face 47 engages the back of the preformed partially turned over edge of the work element 45 and the vertical inner face 48 of the roll 21 engages the front side of the preformed partially turned over edge of the work element 45. The work element 46 is arranged on roll 17 in such a manner that its preformed edge will take a position against the preformed edge of the work element 45 and between the front and back of the turned over edge of the work element 45 when the inner face 47 and curved portion 49 of the roll 27 and the vertical face 48 of the roll 21 cooperate with the roll 17 to bring the preformed edges together in the form of a turned over locked peened joint. The cylindrical face 50 of the roll 27 cooperates with the cylindrical surface 51 of the roll 21 in piston-cylinder-like relationship under the influence of either the compression spring 28 when the first foot pedal connected to rod 22 is released or against the influence of the spring 28 when pressure is applied to the first foot pedal. The preformed edges of the work elements 45 and 46 are formed on other machines, not shown.

With the work in place as shown in Fig. 2 and with pressure applied to the first foot pedal to bring the enlarged head 26 against the roll 27 and in turn carry it toward the roll 21, pressure is then applied to the second foot pedal causing the upper roll drive assembly to be lowered toward the bottom roll 17. During these foot pedal operations, the shafts 14 and 25 are constantly rotating so that the rolls 21, 27 and 17 are rotating in the position shown in Fig. 1 and the locked peened joint is formed on the elements in work.

After the joint has been formed, the first and second foot pedals are released thereby causing roll 27 to move away from the roll 21 automatically and the upper roll drive shaft assembly to automatically move away from the roll 17 thus completely releasing the jointed work and permitting the insertion of succeeding work.

As the drive through the pulley 10 is continuous, the operator need only arrange the work within the machine, operate the first and second foot pedals and remove the work. A single operator may produce a maximum amount of work with the use of the machine and accurate, neat and tight joints will be formed without exacting from or requiring a great deal of skill on the part of the operator.

For the purpose of adjusting the operation of the machine involving the movement of the upper roll drive shaft assembly, the turnbuckle 52 is provided by means of which the link 35 may be shortened or lengthened. For the purpose of adjusting the action of the roller bearing 29 the wedge-shaped cam 23 may be locked in a position slightly upwardly or downwardly with respect to the rod 22 by means of the adjusting element 53.

It will be obvious to those skilled in the art that various changes may be made in this device without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. In apparatus for forming a peened joint, the combination of a base roll assembly including a rotatable roll, a continuous drive for driving said roll, a cooperative roll assembly including a first roll and a second roll coaxially arranged with respect to the first roll, the cooperative assembly being pivotally mounted in the frame of the apparatus, said second roll being movable in an axial direction toward and from the first roll, means yieldably urging the second roll from the first roll, means for moving the second roll toward the first roll, means for connecting the cooperative roll assembly to the drive, and means for moving the cooperative roll assembly toward and from the base roll assembly including a rod, a rocker element connected to the rod, the rocker element being pivotally mounted on the frame of the device, a lever, a shaft, said lever being mounted on said shaft, a link connecting the lever to the rocker element, a cam mounted on said shaft, an element secured to the cooperative roll assembly adapted to coact with said cam, rotation of said cam moving the cooperative roll assembly toward the base roll assembly, and yieldable means resisting the movement of the cooperative roll assembly toward the base roll assembly.

2. In apparatus for forming a peened joint, the combination of a base roll assembly including a rotatable roll, a continuous drive for rotating said roll, a cooperative roll assembly including a first roll, a shaft supporting said first roll, said drive rotating said shaft, a second roll coaxially arranged with respect to the first roll, yieldable means for urging the second roll in an axial direction away from the first roll, a second shaft extending within the first shaft, means on said second shaft adapted to engage the second roll, means for moving the second shaft to urge the second roll in an axial direction toward the first roll and means for moving the cooperative roll assembly toward and from the base assembly, including a rod, a rocker element connected to the rod, the rocker element being pivotally mounted on the frame of the device, a lever, a shaft, said lever being mounted on said shaft, a link connecting the lever to the rocker element, a cam mounted on said shaft, an element secured to the cooperative roll assembly adapted to coact with said cam, rotation of said cam moving the cooperative roll assembly toward the base roll assembly and yieldable means resisting the movement of the cooperative roll assembly toward the base roll assembly.

3. In apparatus for forming a peened joint, the combination of a base roll assembly including a rotatable roll, a continuous drive for rotating said roll, a cooperative roll assembly, said cooperative roll assembly including a first roll, a shaft supporting said roll, means adapted to be actuated by said drive for rotating said roll, a second roll having a portion thereof extending within the first roll and coaxially arranged with respect to the first roll, a second shaft extending within the first shaft and having an enlarged end adapted to contact the second roll, means for urging the second shaft and the second roll axially toward the first roll to place the rolls in adjacent position, yieldable means for urging the second roll axially in an opposite direction when said second shaft is moved in an

opposite direction, and means for moving said cooperative roll assembly toward and from the base assembly, including a rod, a rocker element connected to the rod, the rocker element being pivotally mounted on the frame of the device, a lever, a shaft, said lever being mounted on said shaft, a link connecting the lever to the rocker element, a cam mounted on said shaft, an element secured to the cooperative roll assembly adapted to coact with said cam, rotation of said cam moving the cooperative roll assembly toward the base roll assembly, and yieldable means resisting the movement of the cooperative roll assembly toward the base assembly.

WILLIAM J. CAHILL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
Re. 11,871	Sekowsky	Nov. 13, 1900
73,636	Noyes	Jan. 21, 1868
93,181	Gushing	Aug. 3, 1869
220,991	Ross	Oct. 28, 1879
1,873,164	Turnquist	Aug. 23, 1932
1,908,521	Lindgren	May 9, 1933

FOREIGN PATENTS

Number	Country	Date
65,599	Germany	Nov. 22, 1892