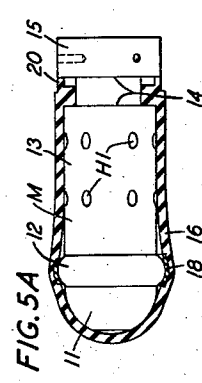
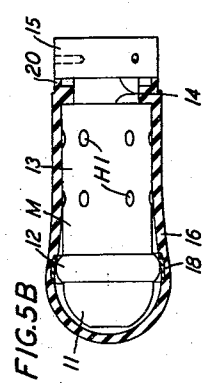
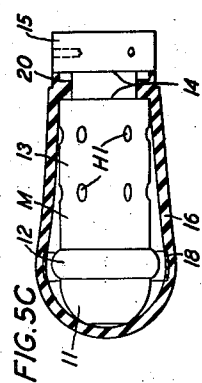
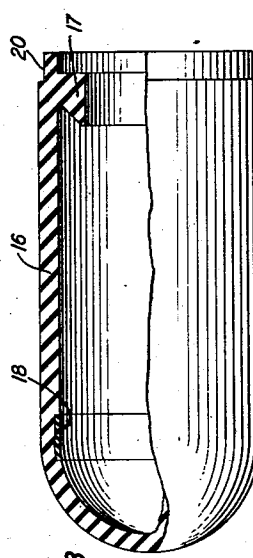
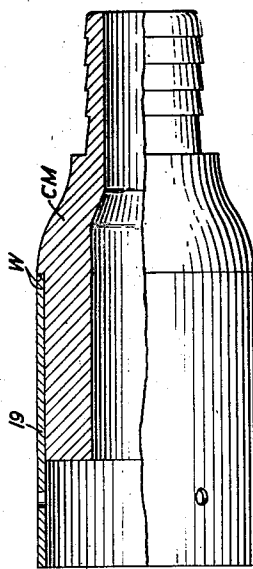
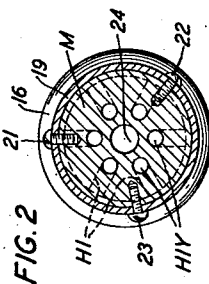
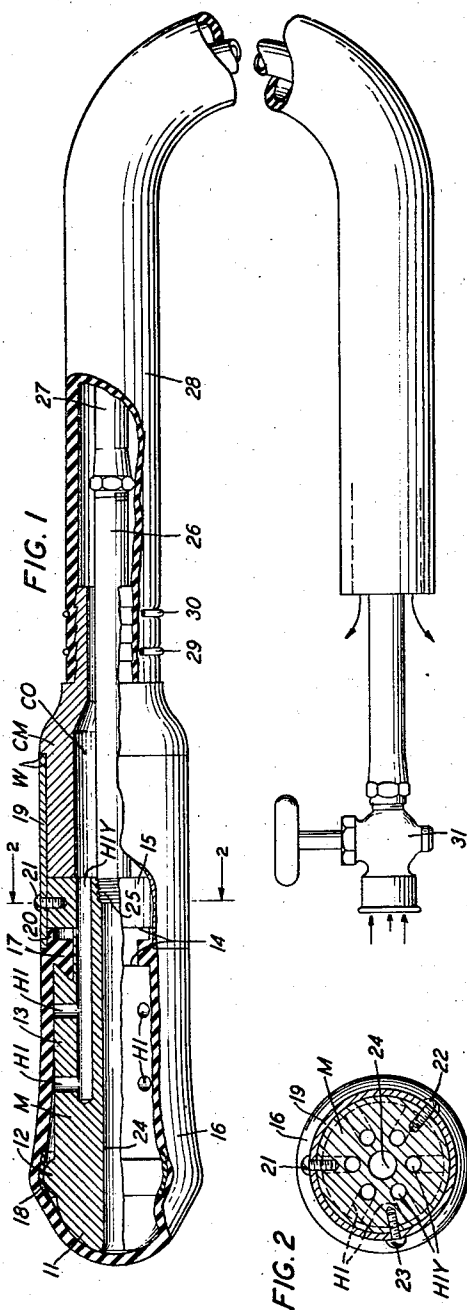


March 25, 1941.

J. F. BARRY ET AL
CONCRETE COMPACTING TOOL

Filed July 8, 1939

2,236,392



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UNITED STATES PATENT OFFICE

2,236,392

CONCRETE COMPACTING TOOL

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Application July 8, 1939, Serial No. 283,356

3 Claims. (Cl. 259-1)

This invention relates to concrete compacting tools of the pneumatic type.

The object of the invention is to simplify the construction of such tools and improve their operation.

In accordance with this invention a concrete compacting tool of the pneumatic type is provided in which a hollow elastic member which is closed at one of its ends is expanded successively longitudinally and circumferentially by a source of constant air pressure distributed through air paths formed by the elastic member in cooperation with a mandrel to which the open end of the elastic member is secured, the longitudinal expansion of the elastic member followed by its circumferential expansion and its retraction under the medium of its own resiliency being effected at a rate of vibration which is dependent upon the air pressure used, the stiffness of the elastic element, and the size of the air paths.

More specifically, a hollow elastic member is tightly fitted to a mandrel having a hemispherical end portion, a peripherally disposed ridge adjacent the plane of the hemispherical portion, and a cylindrically-shaped portion, the cylindrical portion having an annular recess formed therein into which a similarly shaped portion formed with the elastic element fits for securing this end of the elastic element to the mandrel. Means fitted over the elastic element opposite its closed end and secured to the periphery of the mandrel further secures the elastic member to the mandrel and provides means for connecting air outlet paths in the mandrel to one end of a hose forming an exhaust path for the compressed air, while a tubing which is disposed concentric to the air outlet hose is connected to an air inlet path in the center of the mandrel and longitudinally thereto, this inlet path being normally closed by the tension of the elastic element on the hemispherical portion of the mandrel, and means vulcanized in the expansible element at its point of contact with the ridge carried by the mandrel is provided for preventing excessive wear to the elastic element at this point upon the continued successive elongation and circumferential expansion of the elastic element for compacting the concrete into which the tool is applied.

Other novel features and advantages of the invention will appear by the following description and by the claims appended thereto, reference being had to the accompany drawing in which:

Fig. 1 is an assembly view partly in section;

Fig. 2 is a cross-sectional view taken on line 2-2 of Fig. 1;

Fig. 3 is a view of the elastic element partly in section;

Fig. 4 is a detailed view; and

Figs. 5A, 5B and 5C are views showing the cyclic expansion changes of the elastic element when acted upon by a constant air pressure during the operation of the tool in the compacting of the concrete mix.

In the tool of the invention, a metallic mandrel M is formed at one of its ends with a hemispherical portion 11, a cylindrical portion 13 having at its periphery a circular ridge portion 12 adjacent the plane of the hemispherical portion, and a circular groove 14 in the cylindrical portion.

Over the mandrel M thus formed is fitted an elastic element 16 such as rubber, having an interiorly formed ridge 17 shown in Figs. 1 and 3 engaging the circular groove 14 in the mandrel M while a strip 18 of abrasion resisting material is vulcanized in the rubber in registry or coacting relation with the peripheral ridge 12.

The elastic element 16 is further held in position on the mandrel M at its open end by the engagement of a metallic sleeve 19 fitted over the reduced end portion of this element while the other end of sleeve 19 is secured to collar 15 of mandrel M by a number of screws 21, 22 and 23, shown in Figs. 1 and 2. The other end of sleeve 19 is welded to a connector member CM having a reduced end portion for receiving one end of a hose 28 to be secured thereon as by wire clamps 29 and 30, this hose serving as an exhaust path for the compressed air, as will be hereinafter described in detail.

The mandrel M is provided with a central longitudinal air inlet path 24 which is screw-threaded as at 25 for receiving a similarly screw-threaded end of a tubing 26 having its other end connected to a hose 27 disposed concentric to the hose 28, while the other end of hose 27 is provided with a valve 31 for connection with an ordinary air compressor (not shown).

The mandrel M is provided with series of radially disposed holes such as H1-H1 shown in Figs. 1, 2, 5A, 5B and 5C and the holes H1-H1 of each series communicate in respective longitudinally disposed holes as H1Y, forming air exhaust paths leading toward the central air outlet path CO and hence into the annular or concentric space formed by the hose 28 and the air inlet hose 27.

In the operation of the tool of the invention, with the elastic member 16 in position on the

mandrel M as shown in Figs. 1 and 5A and with the air inlet tube 27 connected to a source of compressed air through the operation of valve 31, the air entering into the central air path formed by hose 27, the tubing 26 and the bore 24 in the mandrel M causes the momentary elongation of the elastic member 16 and thereby relative movement between the mandrel M and said elastic member. Upon the movement of mandrel M relative to the elastic member 16 from the position shown in Fig. 5A to the position shown in Fig. 5B which is now under its retractile effect, the member 16 is caused to expand circumferentially from its point of contact with the ridge 12 to a point shown in Fig. 5C while simultaneously coming in contact with the end of the mandrel for closing this air inlet path. Under this condition the compressed air is permitted to escape through the path formed between the peripheral ridge 12 and the ring 18 of abrasive material and hence into the series of radial holes H1-H1 and corresponding exhaust holes H1Y leading to hose 28 concentric to tubing 27. The passing of the compressed air between the ridge 12 and the ring 18 of abrasive resisting material and the simultaneous return of the mandrel in contact with the end of the elastic member 16 successively translates the constant air pressure into pulsing air current and this cycle of operations is continued as long as the tool is connected to the compressed air which may be interrupted by the closing of the valve connecting the inlet air paths to the air compressor.

What is claimed is:

1. A pneumatic concrete compacting tool comprising a mandrel having an air inlet path longitudinally thereof, an elastic member fitted under tension over said mandrel to normally close said air inlet path at one end of said mandrel, means carried by said mandrel at its periphery cooperating with said elastic member to form a circumferential air outlet path, the elastic mem-

ber under air pressure from said air inlet path being caused to alternately expand longitudinally and circumferentially upon the successive passing of the air under pressure from said air inlet path to said outlet air path.

2. A pneumatic concrete compacting tool comprising a mandrel having a longitudinally disposed air inlet path and a ridge at its periphery, an elastic member fitted over said mandrel and having one of its ends secured thereto and its other end normally closing said air inlet path, a plurality of exhaust paths in said mandrel contiguous to said ridge, a connector member secured to said mandrel contiguous to said exhaust path and a connector member secured to said mandrel contiguous to said air inlet path, disposed concentric to the first-mentioned connector, the compressed air from said inlet path causing the expansion of said elastic member for successively opening said air inlet path at the end of said mandrel and the outlet path formed by said ridge and said elastic member.

3. A pneumatic concrete compacting tool comprising a mandrel formed with a hemispheric portion and a ridge portion, a cylindrical portion and a collar portion in the cylindrical portion, an elastic member concentrically disposed on said mandrel and having one of its ends secured to said collar, said mandrel having a centrally longitudinally disposed air path, a tubing connecting said air path to a source of compressed air, the compressed air successively expanding said elastic member at its points of contact with the end of said mandrel and said ridge, an air exhaust path formed in the cylindrical portion of said mandrel and a tubing connecting said air exhaust path disposed concentric to the first-mentioned tubing.

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