Jan. 1, 1946. G. RITTER 2,392,190

CORE SUPPORT FOR EXTRUSION MACHINES

Filed June 14, 1944

Fig. 1.

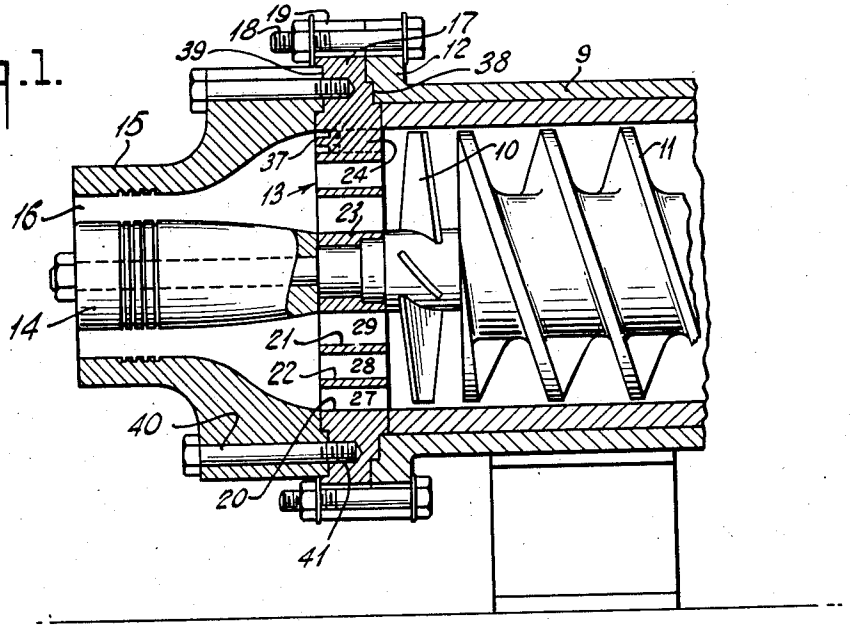


Fig. 2.

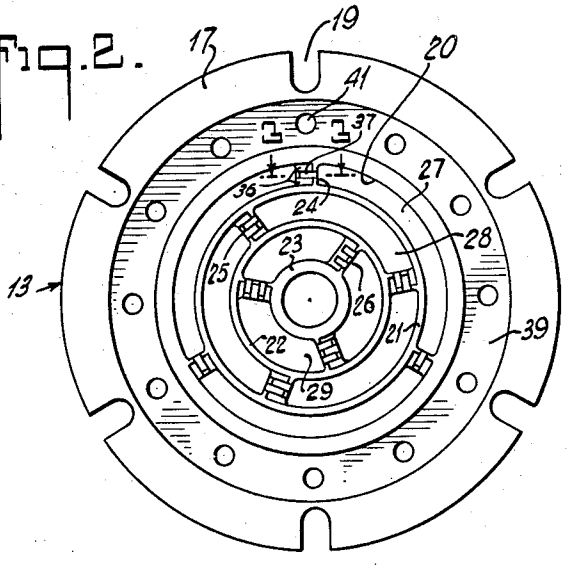


Fig. 3.

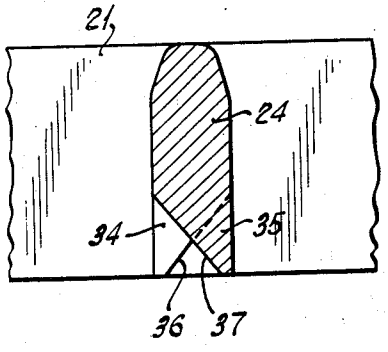
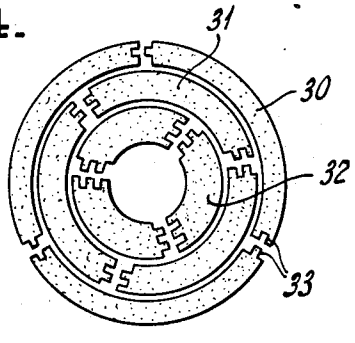


Fig. 4.



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CORE SUPPORT FOR EXTRUSION MACHINES

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2 Claims. (Cl. 25—17)

This invention relates to an extrusion machine of the type comprising a die and a stationary core for making pressure pipe from an asbestos-cement or fibro-cement composition, and more particularly to an improved core support for such machine.

It is necessary that the core of the machine be rigidly supported. Heretofore the core has been supported on a spider. While the spider supports the core satisfactorily, it has been found that pipes made on machines using a spider support develop longitudinal lines of weakness extending continuously throughout the wall corresponding to the position of the spider arms.

The primary object of the present invention is to overcome that objection by the provision of a concentric ring core support that will avoid forming such lines of weakness in the wall and that will result in the production of pipes of increased beam, deflection, and hydrostatic strength.

The invention will be understood from the following description thereof, reference being had to the accompanying drawing in which:

Figure 1 is a vertical section through part of the extrusion machine, showing the core and its concentric ring support;

Fig. 2 is a view of the front face of the concentric ring core support;

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

Fig. 4 is a diagrammatic view of the material as passed through the openings of the concentric ring core support.

The machine comprises a cylindrical casing 9 in which the propeller blades 10 and the feed auger or screw 11 rotate. The front or head end of the casing carries an encircling flange 12. Detachably secured to and disposed in front of this flange is the support 13 for the stationary core 14. A cylindrical partly tapered die 15 is detachably secured to and disposed in front of the core support 13. The material to be extruded is expressed in tubular form through the annular opening 16 between the core and the inner peripheral surface of the die.

The core support, to which this invention particularly relates, and which is indicated generally by the reference character 13, has an outer flange portion 17 corresponding substantially in size and shape to the flange 12. The two flanges are detachably fastened together by bolts 18 passing through slots 19.

The support 13, as will best be seen on reference to Fig. 2, is in the form of a skeleton consisting of a plurality of concentric rings connected together at intervals by radial arms. The entire support may be made of one piece or of several pieces suitably united together. The flange portion 17 has an inner circular peripheral face 20. The interior diameter of the flange, at its circular face 20, is the same or substantially the same as that of the interior wall or liner of the casing 10. Spaced inwardly from and concentric with that face are two ring portions 21 and 22, which portions are spaced from each other. As shown, the spacing of ring 21 from the face 20 of the flange 17 is somewhat less than that between the rings 21 and 22 but such spacing may be varied. In some cases more than two intermediate rings may be provided and in other instances only one intermediate ring may be needed depending on the diameter and wall thickness of the pipe to be made.

At the center of the support is a cylindrical ring member 23 in the opening of which the stationary core 14 is rigidly supported. The member 23 is concentric with the rings 21 and 22 as well as the flange 17, and is spaced inwardly from the ring 22.

The several members or portions 17, 21, 22 and 23 of the core supporting skeleton are connected together at intervals by relatively thin, radially extending arms or plates 24, 25 and 26. The arms 24 connect the flange 17 with the ring 21, the arms 25 connect the rings 21 and 22, and the arms 26 connect the latter ring with the core supporting ring 21. The arms connecting each ring with the adjacent one are preferably spaced about 120° from each other and it will be noted that the arms of the several sets, that is to say the arms 24, 25 and 26, are out of radial alinement with one another for the reasons hereinafter described.

By this arrangement a series of relatively long arcuate shaped openings or passages 27, 28 and 29 are provided between the several ring members or portions of the skeleton support, through which openings the material being extruded passes as it is delivered from the auger 11 to the die 15, and by which it is formed into a plurality of concentric sections 30, 31 and 32 as indicated diagrammatically in Fig. 4 of the drawing.

The front end of each arm, that is the ends adjacent the die, are preferably so formed as to mold tongue and groove joints 33 in the meeting edges of the sections. This may be conveniently effected by providing the front end of each arm with alternating portions or fingers 34, 35 having oppositely directed angular faces 36, 37 which

serve to mold intermeshing tongues and grooves in the side edges of the sections of the material as they are being discharged from the support.

Because of the fact that the radial arms connecting the several ring portions or members of the skeleton support are out of radial alinement with each other, the joints 33 formed in the several sectional tubes fall in circumferentially staggered relation and thus avoid presenting longitudinal lines of potential weakness extending continuously throughout the thickness of the wall of the pipe. This results in the production of extruded pressure pipe of increased beam, deflection, and hydrostatic strength.

The rear face of the support 13 may be formed with rearwardly stepped circular flanges or projecting portions 38 that are received in corresponding recesses in the front or contacting face of the flange 12 so as to effect a tight joint between the auger casing and the core support.

The front face of the support may have an annular recess or depression 39 for receiving the inner end of the die 15 and thus providing a tight fit between these parts. The die is detachably secured to the support in any suitable manner, as for example, by means of bolts 40, the inner threaded ends of which screw into tapped holes 41 in the support. Means may also be provided to permit of any slight adjustment that may be needed for centering the die properly with respect to the core.

In extrusion of the asbestos-cement material through the die, the sectional tubes are united under a high degree of compression to form a pipe or tube having a homogeneous wall structure of increased strength. Hydrostatic tests made of asbestos-cement pipes made with an extrusion machine having a concentric ring core support show that they have considerably higher and more uniform wall strength than those made with a machine having a spider core support. The hydrostatic breaks in the former were quite violent and irregular, without any indications of the longitudinal line breaks which were characteristic of the latter. It has also been found that the improved core supporting structure permits of use of longer asbestos fibres in the Portland cement composition of which the pipe is made.

While I have illustrated and described a preferred form of the core supporting structure and assembly, it is to be understood that modifications may be made thereof within the scope of the claims.

What I claim is:

1. A core support for an extrusion machine, comprising an outer flange member having a circular inner face, a central member on which a core is supported, a plurality of intermediate ring members concentric with the central member and the circular face of the flange member, the spacing between said members being gradually decreased from the central member to the flange member, and radial arms connecting the several members.

2. A core support for an extrusion machine, comprising an outer flange member having a circular inner face, a central member on which a core is supported, a plurality of intermediate ring members concentric with the central member and the circular face of the flange member, the spacing between said members being gradually decreased from the central member to the flange member, and radial arms connecting the several members, said arms being out of radial alinement whereby the material passing through the support is divided into a plurality of concentric sectional tubes of different thickness with the joints of the sections in circumferentially staggered relation, each arm having at its front end alternating oppositely inclined fingers for forming intermeshing joints in the side edges of the sections of material as they leave the support.

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