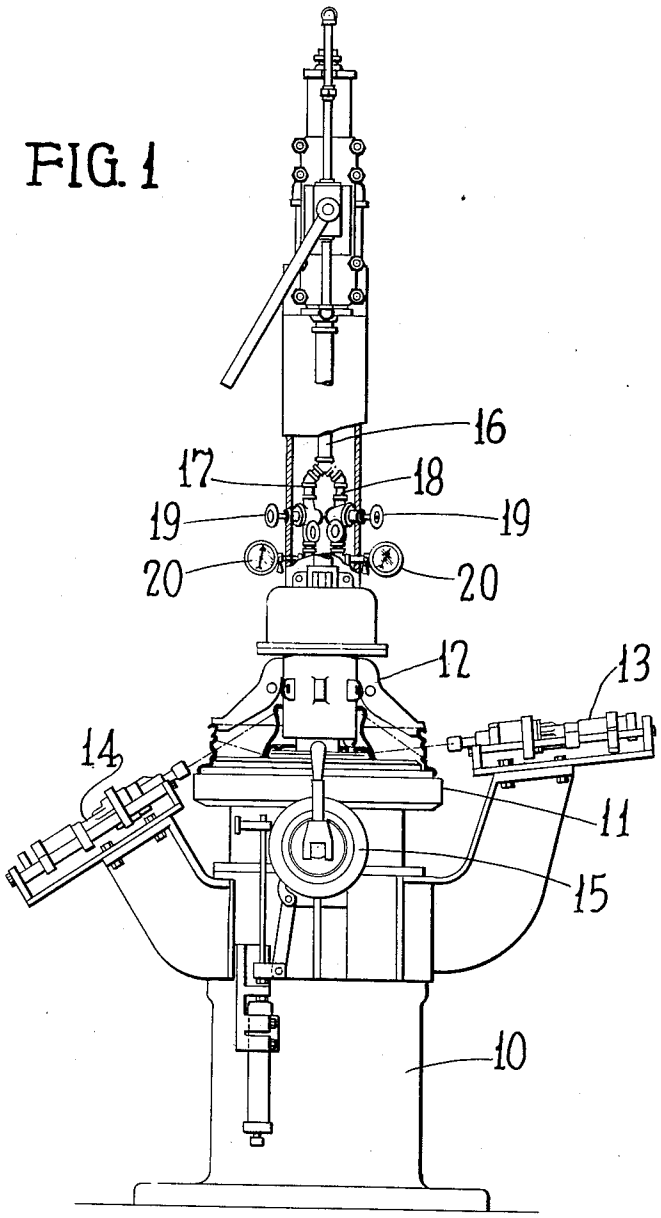
Aug. 8, 1933. C. L. EKSERGIAN 1,921,223

METHOD OF DIFFERENTIALLY TRUING WIRE WHEELS

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FIG. 1



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FIG.2

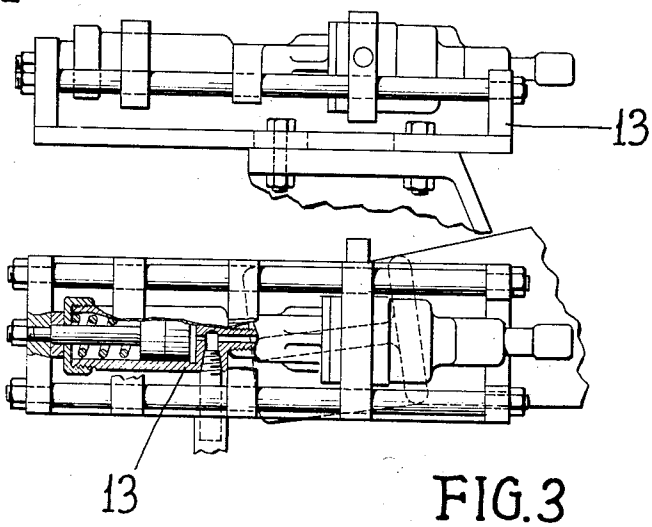


FIG.3

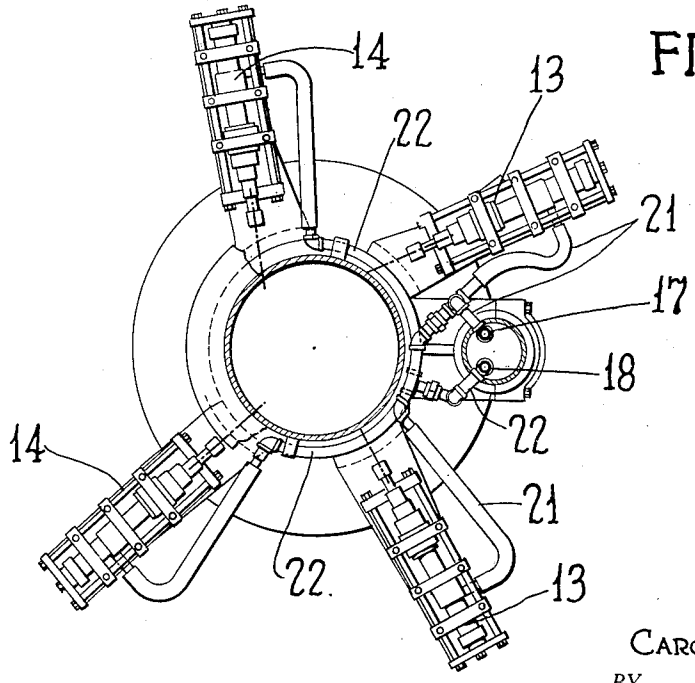


FIG. 4

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METHOD OF DIFFERENTIALLY TRUING WIRE WHEELS

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Application January 3, 1931. Serial No. 506,349

4 Claims. (Cl. 29—87)

Machines have previously been devised for tensioning wire wheels by means of tools operating upon the individual spokes and controlled by fluid pressure motors. Two such machines are disclosed in the patent applications of Warren H. Farr, C. L. Eksergian and Obed E. Smith, Serial No. 479,842, filed September 5, 1930 and of C. L. Eksergian and Obed E. Smith, Serial No. 479,818, filed September 5, 1930. In the first of these applications a plurality fo fluid pressure motors is employed for simultaneously actuating a plurality of tools which is less than the total number of spokes, and the wheel is indexed between successive operations upon successive pluralities of spokes. In the second application the number of tools is the same as the number of spokes and every one of the spokes is tensioned simultaneously by the control of a single valve for permitting ingress of fluid pressure to all of the motors simultaneously.

My invention involves an improvement over machines of the type disclosed in these two applications. It is often desirable to tension two or more axially spaced sets of spokes such as those involved in a conventional wire wheel to different degrees, the spokes of a given series being equally tensioned and the spokes of a second series being likewise equally tensioned but to a different degree from the spokes of the first series. This is necessitated by reason of the different conditions of angularity and different numbers of spokes in the respective series. When these factors vary between the several sets of spokes it is necessary to produce a greater tension in one set of spokes than in the other in order to balance the wheel. My invention involves a simple and adequate method of effecting this differential tension. This method consists in the control of the pressure simultaneously applied to the two sets of spokes in such a way that a greater pressure is applied to the tools operating upon one of the sets than to the tools operating upon the other. I have disclosed the use of the invention of my improved method in the machine of application Serial No. 479,842, although it will be obvious that the principle thereof could be applied to machines such as that involved in application Serial No. 479,818 or in connection with still other machines.

Further advantages of my invention and the method of which I have attained the objects thereof will be apparent from a reading of the sub-joined specification in the light of the attached drawings, in which

Figure 1 is a front view of my machine.

Figure 2 is a detail view in side elevation of one of the fluid pressure motors used thereon.

Figure 3 is a plan view of the motor of Figure 2 with parts being shown in section to illustrate the ports for controlling the fluid pressure thereto, and

Figure 4 is a plan view of my machine with the upper portions thereof cut away to illustrate the connections between the air lines and the respective fluid pressure motors.

Referring to the drawings by reference characters, the numeral 10 designates the base of the machine having a support 11 mounted thereon adapted to receive a conventional wire wheel. A clamp 12 is adapted to secure the wheel firmly in place upon this support during the tensioning operation. A plurality of fluid pressure motors 13 and 14 are aligned with the respective series of spokes and are adapted to operate upon the conventional nipples secured to the ends of said spokes to tension the same by a rotation of these nipples. While the particular construction of these motors forms no part of my invention, it may tbe stated briefly that each of them comprises a conventional air drill motor which is bodily reciprocable by means of a reciprocating motor secured to the end thereof. Each of these motors is provided upon its end adjacent to the spoke nipples with a conventional tool for operating upon the nipples, usually a screw driver tool.

In the particular form of my invention illustrated, the number of motors used is smaller than the total number of spokes and the wheel is accordingly indexed by a mechanism 15 effecting an intermittent rotation of the table supporting the same. The tools thus operate upon the successive spoke locations until every spoke in the wheel has been tensioned. Such indexing mechanism will, of course, be unnecessary in connection with a machine such as that involved in application Serial No. 475,818 above mentioned, and it is merely shown in the present application for the purpose of illustration.

As so far described, my machine is identical with that of the machine of application Serial No. 479,842. My invention consists in the redesigning of that machine to effect a differential pressure and a separately controlled pressure in each of the respective spoke sets. It is frequently desirable to effect a greater tension in one set of spokes than in another, due to differences of angularity and numbers of spokes, etc. I have re-designed the machine of the above application in order to take care of such

a situation by separately controlling the fluid pressure to the separate sets of spoke locations. The numeral 16 indicates the main air line which is controlled through a suitable valve for allowing the ingress of fluid under pressure to the screw driver operating motors. This main line is divided into two branch conduits 17 and 18 and each of these branch conduits is controlled by a separate reducing valve 19. Separate gauges 20 are provided for the two lines in order to indicate the pressure in the respective systems.

The line 17 is connected to the motors operating upon one of the axially spaced series of spokes through connections 21, while the line 18 is connected to the tools operating upon the other of said series through the connections 22. The pressure exerted in tensioning the spokes of the respective series is thus separately controlled through the separate reducing valves 19. As the motors stall as soon as the spokes attain a pre-determined tension corresponding to the pressure in the line operating the motors effecting that tension, the tension in the spokes may be accurately pre-determined by a proper control of the reducing valves.

Modifications of my invention will be obvious to those skilled in the art and I do not therefore wish to be limited except by the scope of the sub-joined claims as interpreted in the light of the generic spirit of my invention.

What I claim is:

1. The method of tensioning a wire wheel consisting of a hub and rim interconnected by a plurality of axially spaced series of spokes which comprises clamping the hub and rim in the relative positions they will occupy in the completed wheel, then simultaneously tensioning individual spokes of each given series equally but of the several series to different degrees.

2. The method of tensioning a wire wheel consisting of a hub and rim interconnected by a plurality of axially spaced series of spokes which comprises clamping the hub and rim in the relative positions they will occupy in the completed wheel, then simultaneously tensioning individual spokes of the several series by means of fluid pressure, the spokes of each given series being tensioned equally but the spokes of the several series being tensioned to different degrees.

3. A machine for tensioning a wire wheel consisting of a hub and rim interconnected by a plurality of axially spaced series of spokes which comprises means for clamping the wheel, a fluid pressure motor adapted to operate a tool for tightening the spokes of one of said series, a second fluid pressure motor adapted to operate a tool for tightening the spokes of another of said series, and separate means for individually controlling the pressure of the fluid supplied to the respective motors.

4. A machine for tensioning a wire wheel consisting of a hub and rim interconnected by a plurality of axially spaced series of spokes which comprises means for clamping the wheel, a plurality of fluid pressure motors adapted to operate tools for tightening the spokes of one of said series, a second plurality of fluid pressure motors adapted to operate tools for tightening the spokes of another of said series, and separate means for individually controlling the pressure of the fluid supplied to the respective pluralities of fluid pressure motors.

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