

July 22, 1969

F. A. DAWES

3,456,470

SPRING COILING MACHINES

Filed Aug. 8, 1967

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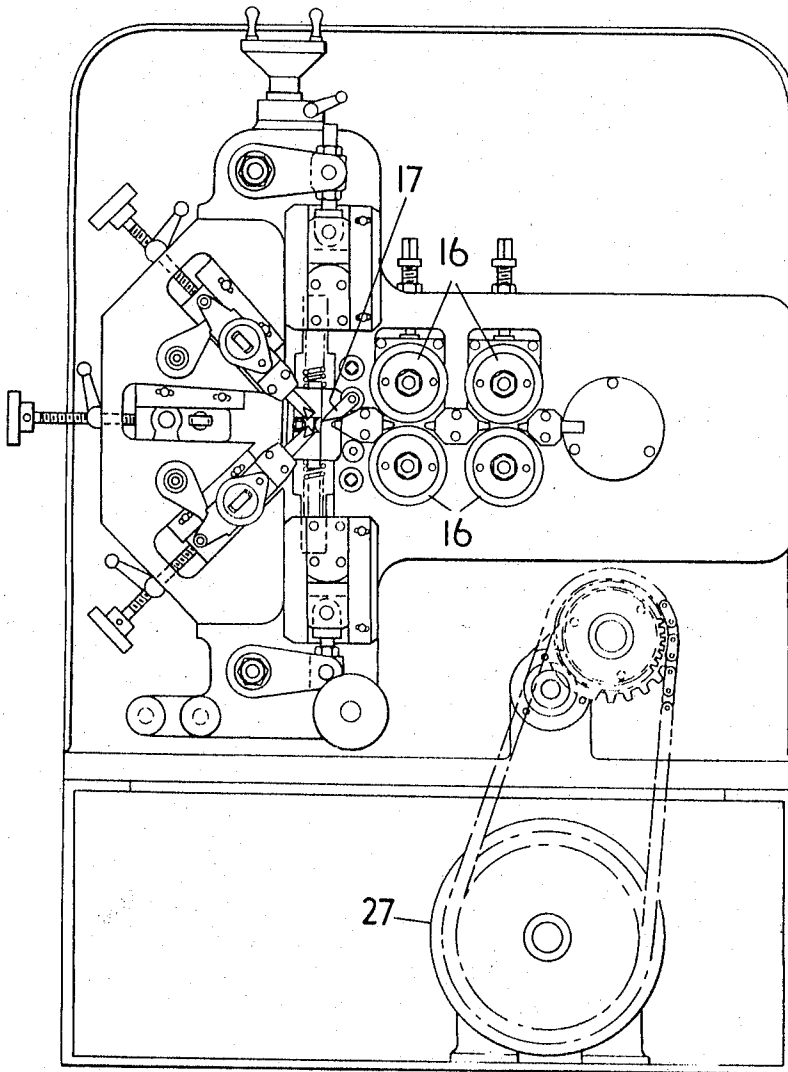


FIG. 1.

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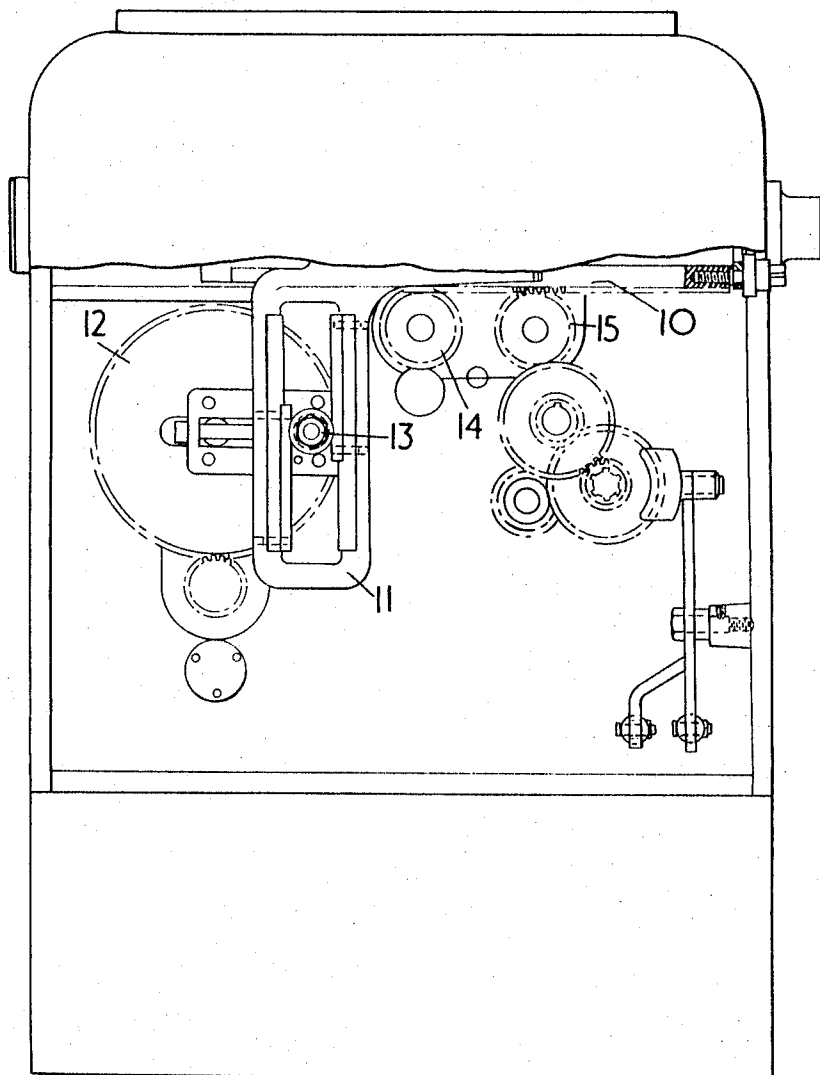
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FIG. 2.



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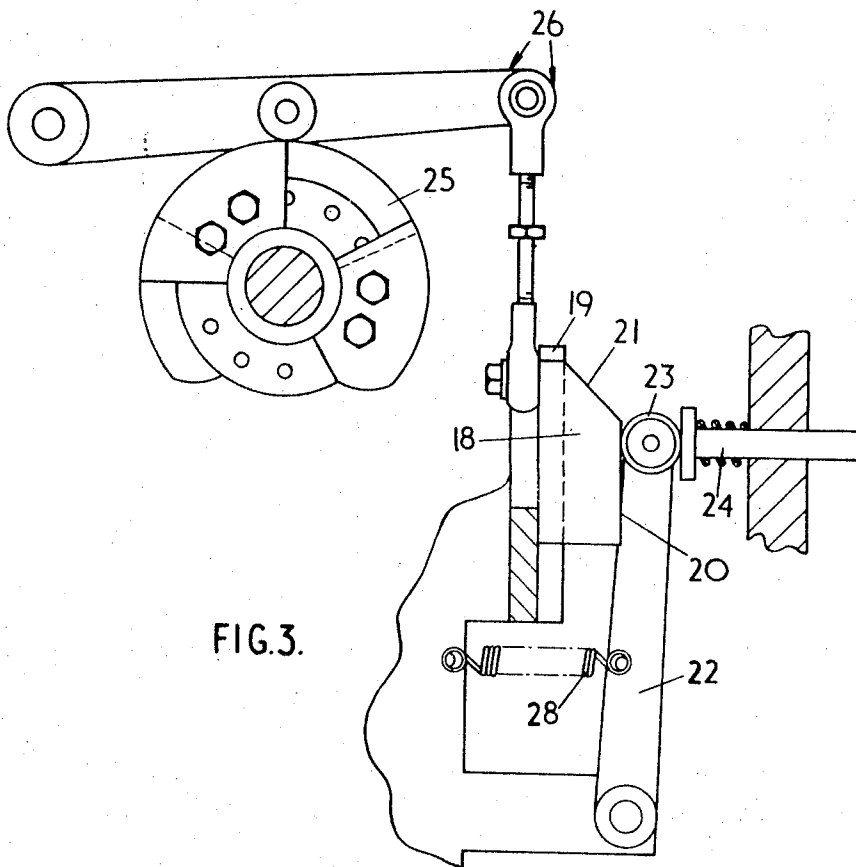
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SPRING COILING MACHINES

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3 Claims

ABSTRACT OF THE DISCLOSURE

Mechanism for actuating the pitch tool which controls the spacing of adjacent coils of wire in a spring coiling machine, said mechanism having a rectilinearly movable first cam, a rotatable second cam, means interconnecting the two cams whereby rotation of the second cam will effect rectilinear movement of the first cam, and a plunger which is adapted to actuate the pitch tool and which is movable in a direction transverse to the direction of movement of the first cam so as to be movable thereby, the first cam having a first face which extends in a plane parallel to the direction in which said first cam is movable and a second face inclined to the first face, the first face being operative when the plunger is in a position in which the pitch tool is in its working position.

This invention relates to a spring machine of the kind adapted to form helically coiled springs and which includes feed rolls which are rotatable for the purpose of advancing a length of wire that is to be coiled into a spring, and a pitch tool which in use is adapted to engage a coil of wire in order to deflect it and provide any desired spacing between adjacent coils in the spring.

The object of the present invention is to provide in an improved form mechanism for actuating the pitch tool in a spring-coiling machine of the kind specified.

In accordance with the invention there is provided in a spring coiling machine of the kind specified mechanism for actuating the pitch tool which comprises a first cam mounted for rectilinear movement and having a first face which extends in a plane parallel to the direction in which the cam is movable and a second face which is inclined to said first face, a plunger movable in a direction transverse to the direction of movement of said first cam so as to be movable thereby, said plunger being adapted to actuate the pitch tool, a second rotatable cam and means connected to the first cam and engageable by the second cam whereby rotation of said second cam will effect rectilinear movement of the first cam and actuation of said plunger.

The invention will now be more particularly described with reference to the accompanying drawings wherein,

FIGURE 1 is a front view of one form of a spring coil machine including pitch tool actuating mechanism constructed in accordance with the invention,

FIGURE 2 is a view of the same machine with part of the rear wall removed, and

FIGURE 3 shows in detail and in diagrammatic form the mechanism for actuating the pitch tool.

Referring to the drawings, the machine shown therein is provided with a reciprocable rack 10 having a slotted extension 11, the rack being reciprocable by means of a rotatable driving member 12 having an eccentrically mounted roller 13 which engages with the slot in said rack extension 11.

The rack is connected to a pair of uni-directional driving devices 14 and 15 which are themselves connected to feed rolls 16 for advancing wire through the machine, the arrangement being such that said uni-directional driving devices enable a drive to be imparted to said feed

rolls 16 irrespective of the direction of movement of the rack. Wire fed by the feed rolls engages a mandrel (not shown) in the known manner whereby it is formed into a helical spring so that two springs will be formed during each complete cycle of movement of the rack 10.

There is also provided a pitch tool 17 which is movable between inoperative and operative positions, said tool in its operative position being adapted to engage a coil of wire so that adjacent coils in the spring can be spaced apart at any desired interval. The pitch tool 17 is movable into its inoperative position when a spring has been completed in order that cutting off mechanism of conventional form can sever the formed spring. The pitch tool then is required to move into its operative position ready for the next spring.

The present invention is more particularly concerned with mechanism for moving the pitch tool 17 between its operative and inoperative positions and to this end (as shown in FIGURE 3) there is provided in the machine a first cam 18 which is mounted in a slide 19 connected to the machine so as to be movable in a rectilinear direction which is perpendicular to the direction of movement of the pitch tool 17 between its operative and inoperative positions. Said first cam 18 includes a first face 20 which extends in a plane which is parallel to the direction of movement of the first cam and perpendicular to the direction of movement of the pitch tool. The first cam also has a second face 21 which extends in a plane inclined to the plane of the first face. In addition there is provided an arm 22 which is pivoted at one end and which carries a roller 23 at its other end, said roller being disposed between the first cam 18 and one end of a spring loaded plunger 24 which is adapted at its other end to effect movement of the pitch tool 17.

The mechanism also includes a second and rotatable cam 25 which is conveniently formed to any part circular or other curved form.

Means such as any convenient form of linkage 26 connected to said first cam 18 is adapted to be engaged by the second cam 25 so that rotation of the latter by an electric motor 27 and gearing (not shown) will have the effect of moving the first cam 18.

When the pitch tool 17 is in its inoperative position the aforementioned roller 23 carried by said arm 22 rests on said inclined second face 21 of the first cam, the spring loading of the plunger 24 and a spring 28 attached to said arm acting in a direction such that the plunger 24 and the pitch tool 17 will be withdrawn. Rotation of the second cam 25 will however effect rectilinear movement of the first cam 18 so that said roller 23 rides over the second face 21 of the first cam and onto the first face 20 as shown in FIGURE 3, thereby moving the plunger and also the pitch tool into its operative position. It will be appreciated that whilst said roller 23 engages the first face 20 of the first cam no further movement of the pitch tool will occur irrespective of movement of the first cam since said first face extends in a plane parallel to the direction of movement of the first cam 18. Any inaccuracies in the contour of the second cam 25 will not therefore result in any movement of the pitch tool 17 and it is only when said rotatable cam 25 reaches a position which permits the first cam 18 to return to its original position in which said roller engages the inclined or second face 21 on the first cam that the pitch can move into its inoperative position.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a spring coiling machine of the kind adapted to form helically coiled springs and which includes feed rolls which are rotatable for the purpose of advancing a length of wire that is to be coiled into a spring, and a pitch tool which in use is adapted to engage a coil of

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wire in order to deflect it and provide any desired spacing between adjacent coils in the spring, mechanism for actuating the pitch tool which comprises a first cam mounted for rectilinear movement and having a first face which extends in a plane parallel to the direction in which the cam is movable and a second face which is inclined to said first face, a plunger movable in a direction transverse to the direction of movement of said first cam so as to be movable thereby, said plunger being adapted to actuate the pitch tool, a second rotatable cam and means connected to the first cam and engageable by the second cam whereby rotation of said second cam will effect rectilinear movement of the first cam and actuation of said plunger.

2. Mechanism as claimed in claim 1 wherein a roller is interposed between the plunger and the first cam.

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3. Mechanism as claimed in claim 2 wherein the roller is mounted at one end of an arm which is pivoted at its other end and which is urged by resilient means in a direction to bring the roller into engagement with the first cam.

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