Oct. 3, 1967 L. E. DIOLOT 3,344,638

EQUIPMENT FOR STARTING THE WINDING OF A STRIP

Filed Feb. 4, 1965 3 Sheets-Sheet 1

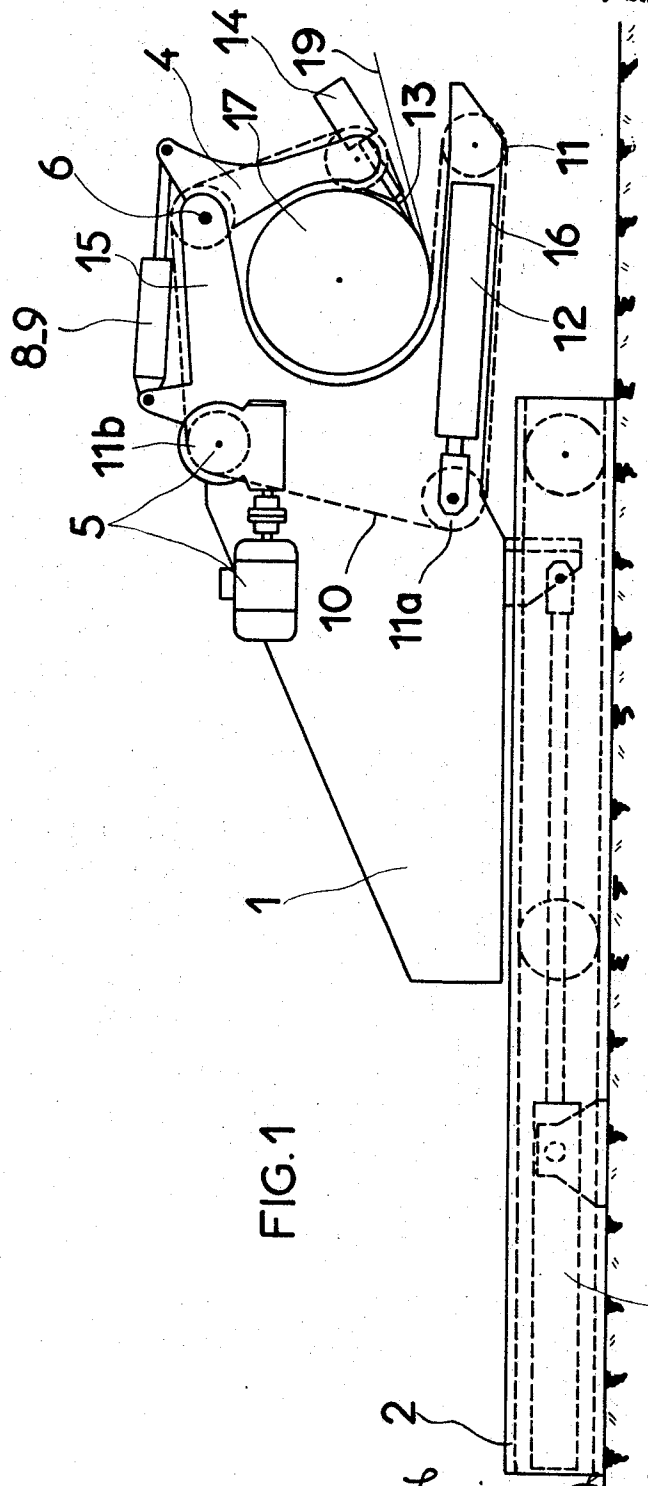


FIG. 1

Lucien Eugène Diolot
by
Edwin E. Greigg

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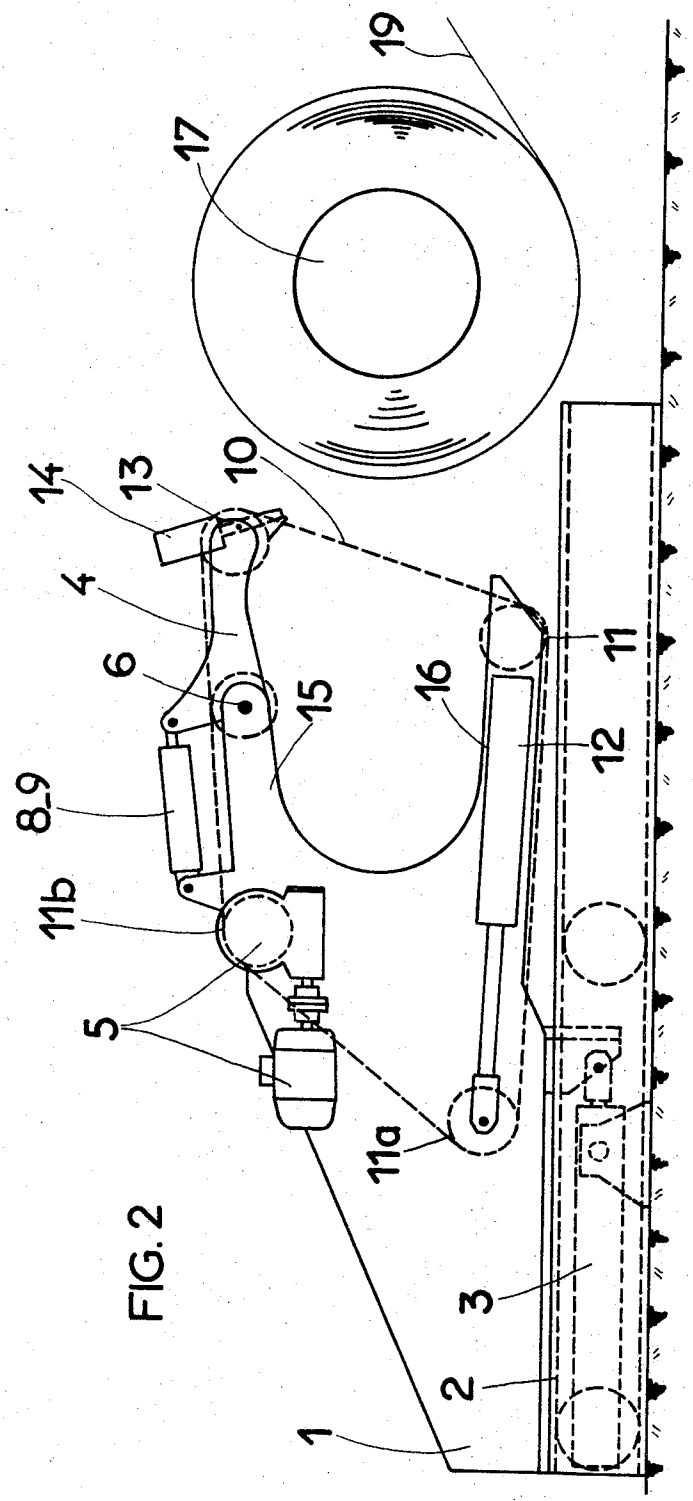


FIG. 2

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FIG. 3

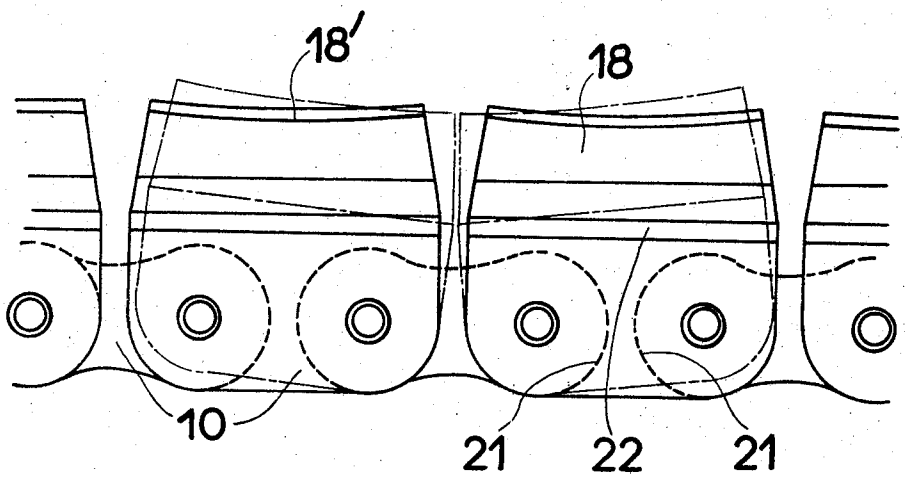
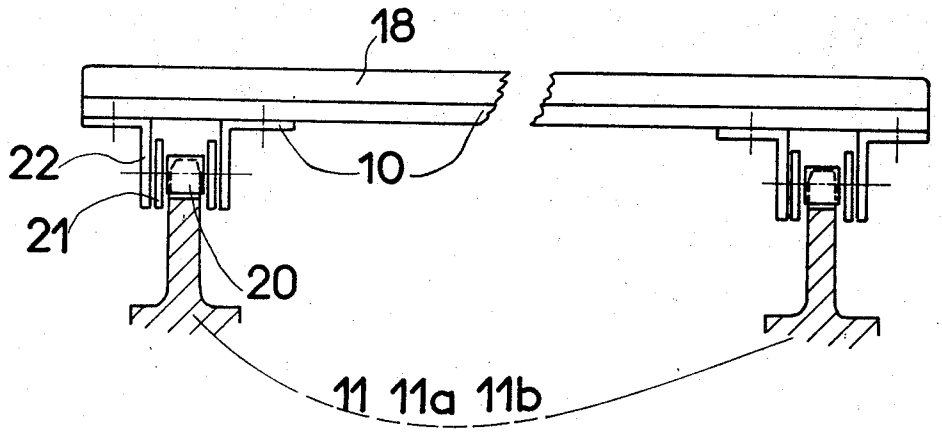


FIG. 4



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EQUIPMENT FOR STARTING THE WINDING OF A STRIP

Lucien Eugène Diolot, Neuilly-sur-Seine, France, assignor to Societe Nouvelle Spidem, Paris, France, a corporation of France

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6 Claims. (Cl. 72—148)

ABSTRACT OF THE DISCLOSURE

This invention relates to devices for initiating winding of a strip material on a drum and more particularly to such devices which can efficiently handle a heavy thick strip material by a new and improved tension means.

As is known, the rolling of strip flat products is followed by the winding of the rolled strip on a cylindrical drum. It is very beneficial that this winding be started automatically without it being necessary to fasten the strip on the drum whatever be the means used. To this end, there has appeared a rather large number of devices which all make use of one or several belts designed to follow the drum surface as closely as possible. The strip is inserted between the belt and the drum and binds itself hoop-like on the drum, its grip being sufficient after a few turns to enable the withdrawing of the belt. Such devices may be used for winding on a drum any flat product fed from a machine other than a rolling-mill, for example, a leveling machine.

These arrangements for starting the winding, according to known prior art, are suitable mainly for thin flexible products. Although improvements have adapted some of these devices for thicker and, consequently, stiffer strips, the belts remain relatively fragile parts which may be cut by the strip metal edges or damaged in the case of hot winding, therefore necessitating their frequent change. Finally, these belts cannot be used above a certain thickness of the strip.

It is therefore the principal object of this invention to increase the lifetime of the winding member.

Another object of the invention is to increase to a large extent the pull on the winding member so as to enable, for a same drum diameter, the winding of metal strips with larger thicknesses than with those devices in the prior art.

Another object of the invention is to provide a device for initiating winding, which has the above-mentioned features and which makes use of pressing means, such as endless chains or endless cables subjected to high tension and which carry in their motion juxtaposed blocks having slight play and curved surfaces conforming to the curve of the winding drum in order to firmly apply the strip thereon.

Still another object of the invention is to prevent scratching of the strips by using metallic blocks covered with a layer of a relatively flexible but of high resistance material, such as superpolyamide, polytetrafluorethylene, agglomerated fine grain graphite.

Other advantages and objects of the invention will be apparent from the following description.

A non-limiting embodiment of the invention will be described hereafter with reference to the accompanying drawing, in which:

FIGURE 1 is an elevation of the equipment for starting the winding, the pressing device having just been applied around the drum in order to receive and guide the strip.

FIGURE 2 is the same as FIGURE 1, when the equipment for starting the winding has been pulled away from the drum on which the strip is steadily winding.

FIGURE 3 is an elevation of a section of the chain with its blocks.

FIGURE 4 is a sectional view of the chain showing one way of holding the blocks.

As shown in FIGURES 1 and 2, the arrangement for starting the winding comprises a structure **1**, which may slide on slideways **2** under the action of a jack **3**. This structure terminates towards the front by two slightly diverging arms **15** and **16** between which is left a cavity with a semi-circular bottom such that, when moved into working position (FIGURE 1), it surrounds concentrically the drum **17** of approximately 180° in arcuate length. At the end of the arms **15** and on a spindle **6**, a mobile member **4** may swivel under the action of the jacks **8** and **9**. A chain **10** fitted with blocks **18** (FIGURE 3) is passed over a number of intermediate gears such as **11**, **11***a*, **11***b*, etc., and to this chain is associated at least one tensioning jack such as **12**, which, as shown, perform its duty by moving one of the gears **11***a*, for instance. When not in use, the chain runs in front of the entrance of the cavity via two gears fitted at the ends of the arms **15** and **16**.

At the end of the swivelling member **4** is mounted a jack **14** which may bring forward or backward on elongated wedge **13**.

The chain **19** is normally set in motion, when in working position, by the strip **19** coming out from the roller; it may be advantageous to help the motion of this chain with an electric motor **5** which is synchronized with the rotation of the drum **17** or which may drive the chain with slight overspeed so as to prevent any crease on the strip **19** when winding.

Each block **18** may be covered with a layer **18'** of a high resistance flexible material provided on its slightly curved surface which applies the strip onto the drum.

The operation of the above-described equipment is as follows:

The drum being free of strip and the equipment being in the position shown in FIGURE 2, the latter is brought into contact with the drum by means of the jack **3** and takes the position shown in FIGURE 1. The swivelling member **4** has moved down under the action of the jacks **8** and **9**.

The elongated wedge **13** is held provisionally in the withdrawn position, while the strip **19** arrives and starts winding on the drum **17**, pressed by the chain **10** fitted with blocks. This chain is driven by the strip and if the latter is thick, a driving motor **5** is used, to which a slight overspeed may be given.

When the strip is sufficiently engaged on the drum, while being strongly pressed against it, the wedge is moved forward in such a manner that it makes a very small angle with the strip **19**, the end of which is now coming to place itself under the first turn and is pushed thereunder by the wedge.

A few turns are thus wound around the drum under the pressure of the chain and when the strip is in this way sufficiently tight, the wedge **13** is withdrawn, the swivelling member **4** is moved upward by means of its jacks without allowing the wedge to come into contact with the strip, and the whole equipment is moved backward under the action of the jack **3**. The equipment as well as the chain **10** are back to the position shown in FIGURE 2, while the strip **19** keeps winding regularly around the drum **17**.

The chain bearing the blocks must give the latter a sufficient play so that they may press in a regular and continuous way on the surface of the drum or of the strip; a roller chain such as that shown in FIGURE 3

may be appropriate. The rollers **20** being attached two by two with sideplates **21**, each block may be held by angle parts **22** overlapping two plates. When applying the strip on the drum, the blocks come into the position shown by dotted lines in FIGURE 3.

FIGURE 4 is a section of the chain shown passing over one of the gears **11**.

It is to be understood that detail variants may be provided for when designing the starting equipment according to the orientation of its motion with respect to the drum and to the in-coming strip. In order to be efficient, the elongated wedge **13** must be positioned with a very small angle of incidence with respect to the strip under winding.

Whatever the chain, it is firmly guided transversally by means of the driving and intermediate gears, contrary to what happens unfortunately with a belt, which tends to sway on the intermediate pulleys.

According to the width of the winding drum, one or several chains may work in parallel.

What I claim is:

1. An apparatus for restarting the winding of a flat band made by a device such as a rolling mill comprising: a receiving drum for said band, a mobile frame carrying a pressure member for ensuring the winding under pressure of the first turns of said band onto said drum, said pressure member including a plurality of pinions, one of said pinions being power driven, at least one endless chain means mounted on said pinions and surrounding the periphery of said drum approximately 270° for defining a free passage necessary for the introduction of said band between said chain means and said drum, said mobile frame further carrying a pivotally supported arm the free end of said arm supporting one of said pinions adjacent said passage and a jack means having a linearly reciprocable wedge, said wedge being oriented to form an acute angle of extremely small magnitude with the linear direction of said band before being wound on said drum, whereby said wedge guides the free terminus of said band to thereby close the first turn of said band on said drum.

2. In a device according to claim **1**, wherein said mobile frame is moved forward and backward in a perpendicular direction to the axis of said drum, said frame having a cavity which surrounds concentrically said drum an arcuate length of approximately 180°, said endless chain means being mounted under tension by a selected number of said pinions, tension jacks for moving said selected pinions whereby in non-operating periods said endless chain means moves rectilinearly in front of the entrance of said cavity, and in operating periods said chain means is positioned between said cavity and said drum.

3. In a device according to claim **2**, wherein said pivotally supported arm is actuated by one of said jacks.

4. In a device according to claim **1**, wherein a means is provided for tensioning said chain means, and a plurality of juxtaposed blocks having means secured to said chain means with a slight play to thereby press on said band and said drum firmly and substantially without break of continuity.

5. In a device according to claim **4**, wherein said chain means is a roller chain, said rollers being attached two by two by side plates, each of said blocks being mounted to overlap two adjacent plates on each side of said roller chain.

6. In a device according to claim **4**, wherein each block is covered with a layer of a material preventing the formation of creases on said strip, said material being selected from the group consisting of, superpolyamide, polytetrafluoroethylene and agglomerated fine grain graphite.

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RICHARD J. HERBST, *Primary Examiner.*

A. L. HAVIS, *Assistant Examiner.*