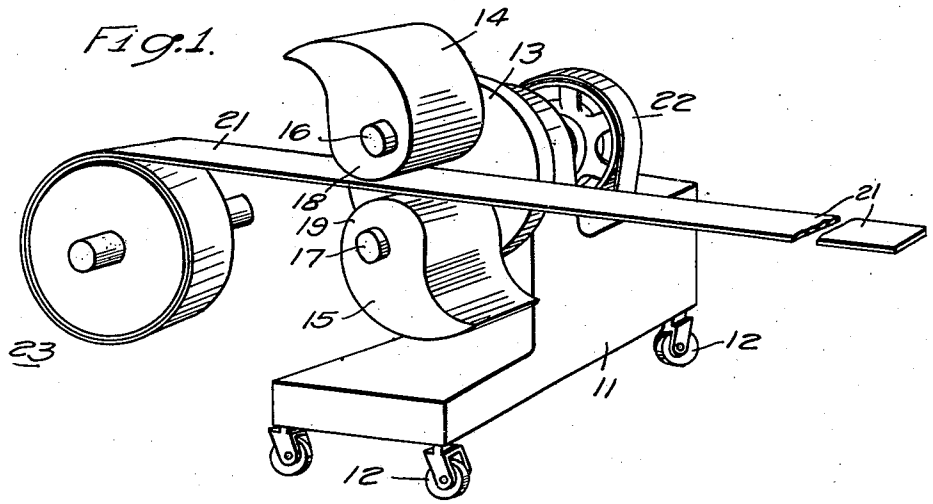
March 26, 1940. G. P. LESSMANN 2,195,008

COILING REEL

Filed Aug. 20, 1937

Fig. 1.



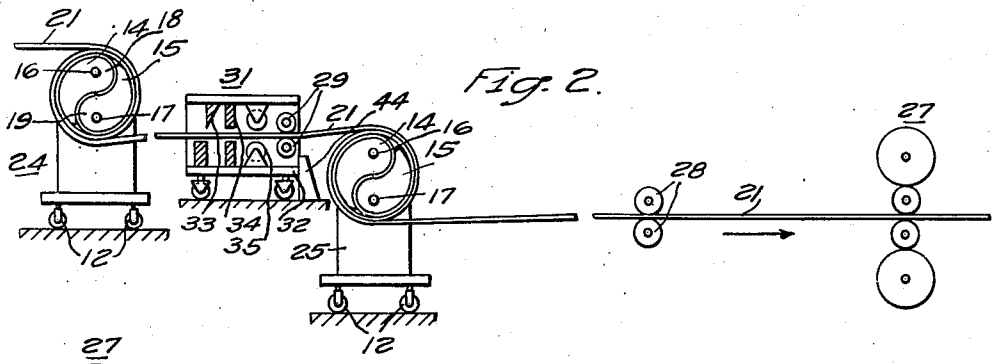


Fig. 2.

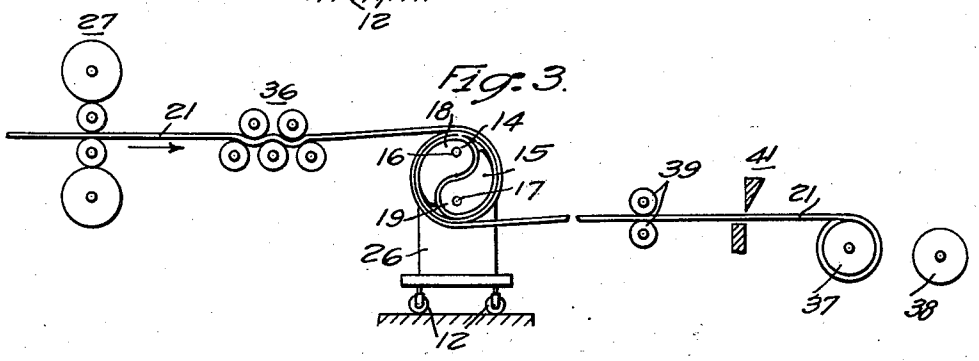


Fig. 3.

WITNESSES:

E. A. McCloskey.

Jos. Weber

INVENTOR

Gerhard P. Lessmann

BY

G. M. Crawford

ATTORNEY

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COILING REEL

Gerhard P. Lessmann, Forest Hills, Pa., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

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11 Claims. (Cl. 242—78)

My invention relates generally to reels for lengths of material.

In the copending application of A. F. Kenyon and W. G. Cook, Serial No. 161,442, filed August 28, 1937, there is described a system for providing a continuous feed for a strip rolling mill which comprises welding the trailing end of the strip as it is moving toward the rolls to the leading end of the next succeeding reel of strip, continuing this process to provide continuous feed for the mill. Such a process has the advantage that the strip may be marketed in rolls of greater and more desirable lengths instead of in short lengths or sheets, that thick ends are eliminated or minimized, and that increased production results from continuous operation of the mill.

Therefore, the object of my invention, generally stated, is to provide strip reels that will facilitate the operation of such a continuous mill.

A more specific object of my invention is to provide a reel which shall wind strip material in such a manner as to leave both ends of the strip accessible.

Another object of my invention is to provide a reel which shall function as an accumulating device so that strip material may be wound on the reel while the end of the strip remains substantially stationary.

A further object of my invention is to provide a reel which shall function as an accumulating device both in providing a continuous feed for a strip mill and in manipulating the reeling of strip material as it is continuously delivered from a strip mill.

These and other objects and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawing in which like reference characters designate like parts and in which

Figure 1 is an illustration in perspective of the winding reel of my invention,

Fig. 2 is a diagrammatic illustration of the use of the reel device of Fig. 1 as a feed reel for a continuous feed rolling mill; and,

Fig. 3 is a diagrammatic illustration of the use of the reel device of Fig. 1 as an accumulating device for strip material as it is delivered from the reducing rolls and is being wound on reels.

In carrying out my invention, I provide a reel device which comprises clamping jaws or detents which engage the strip of material to be wound approximately midway between its ends and then wind the strip on this reel so that the strip is wound thereon from two directions leaving both ends of the material available.

When used as a feed reel for a strip rolling mill, the strip being rolled may be unwinding from the reel and passing through the mill while the other end of the strip is held substantially stationary so that one end of the next succeeding strip may be welded to it to provide a continuous feed for the mill. The reel may be used as an accumulating device between the delivery side of the mill and the winding reel for the strip after it has passed through the mill. When so used, the end of the strip may be practically stopped to facilitate starting the strip on the winding reel while the strip as it is delivered from the mill is being accumulated on the accumulating reel. When the winding reel has been threaded, it winds the strip from the accumulating reel.

Referring now to Fig. 1 of the drawing, a base member 11 mounted upon swivel rollers 12 has mounted upon it a rotatable member or disc 13. Cam-like members 14 and 15 are mounted upon the rotatable member 13 by means of pivots 16 and 17 which extend from the rotatable member 13 substantially parallel to, spaced from, and disposed on opposite sides of the axis of rotation of the rotatable member 13.

The members 14 and 15 are so shaped as to nest together, as shown in Figs. 2 and 3, to form a substantially cylindrical surface to act as a reel core. The pivots 16 and 17 are so offset with respect to the semi-circular ends 18 and 19 of members 14 and 15 as to provide a cam action between the members 14 and 15 so that they will grip the strip of material 21 when they are moved to nesting position.

The rotatable member 13 may be driven in any suitable manner, such as by means of a motor, not shown, mounted in the base 11 and connected in driving relation therewith by the belt and pulley arrangement 22.

In the operation of the winding reel, approximately one-half of the strip 21 is unwound from the reel 23 and the winding reel is moved into a position, with respect to the strip 21, as shown in Fig. 1. When the rotatable member 13 is rotated in the clockwise direction, as viewed in Fig. 1, the cam members 14 and 15 will move to nesting position, gripping the strip 21 and winding it from both directions from the point of contact of the members 14 and 15 with the strip 21. Thus, it will be seen that when the strip 21 is wound upon the winding reel, both of its ends will be on the outside of the reel and readily accessible, as shown in the reel 24 of Fig. 2.

In Fig. 2, there is shown a system for utilizing the reel of my invention as a supply reel for

providing a continuous strip of material for a continuously operating rolling mill. The strip 21 is being passed through the reducing roll stand 27 in the direction of the arrow while back tension is applied to it by tension rolls 28. Pinch rolls 29 are provided for stopping one end of the strip as it unwinds from the reel 25. While the end of the strip is held substantially stationary by the pinch rolls 29, the strip 21 is being continuously passed through the reducing rolls and unwound from the reel 25 which is moving with the strip toward the reducing rolls.

The joining machine 31 comprises a stand 32 which is mounted on rollers to facilitate movement and upon which are mounted a shearing device 33, a welding device 34 and a grinding device 35. These devices are provided for trimming the trailing end of the strip unwinding from reel 25 and the leading end of the strip to be unwound from reel 24 so that they may be matched for welding, welding these two ends together and grinding or otherwise finishing the welded joint so as to provide a continuous smooth strip. In this instance, the pinch rolls 29 are mounted on this stand 32 so that they may be moved therewith or they may be mounted separately if desired. After the welded joint has been finished the joining machine 31 is moved out of the path of the succeeding reel 24 which is moved toward the reducing rolls after reel 25 is unwound. The stop member 44 is provided to prevent the joining machine 31 from moving with the strip as reel 25 is being unwound.

The pinch rolls 29 and the tensioning rolls 28 must be spaced a sufficient distance apart to provide room for the travel of the reel 25 during the time necessary for performing the trimming, welding and grinding operations on the ends of the two lengths of strip that are being joined. When the reel 25 is completely unwound, it may be removed from the strip and the reel 24 will then automatically move forward to take its place and successive reels of strip will be welded together in this manner while the mill 29 is continuously operating upon the strip.

In Fig. 3 of the drawing, there is shown the use of the reeling device described in connection with Fig. 1 as an accumulating reel for accumulating strip material as it is continuously delivered from a mill stand, while a portion of the material is stopped or slowed down when the winding reel becomes filled to permit cutting the material and starting it on an empty reel. The strip 21 is delivered from the mill rolls 27 in the direction of the arrow and is tensioned by the straightening device 36. When the reel 37 has wound a desired length of strip or become filled, and it is desired to start the strip on a new or empty reel, such as 38, the pinch rolls 39 are operated to stop the material so that shear 41 may cut the material to form a new end that may be started on to the new reel 38.

While the strip is stopped by the pinch rolls 39, the accumulating reel 26 is applied to the strip and when rotated in a clockwise direction, will wind strip as it is delivered from the mill and will also wind the strip extending between it and the pinch rolls 39 by moving on its rollers 12 toward the pinch rolls 39.

The distance between the straightening rolls 36 and the pinch rolls 39 must be sufficient to permit the movement of the accumulating reel 26 toward pinch rolls 39 which is necessary in winding the strip as it is continuously delivered from the mill during the time that the end of the strip that is being started on the new reel is stopped by the pinch rolls 39 and during the time that the accumulated material on the accumulating reel is being wound on the new reel.

After the new reel 38 is started, pinch rolls 39 are released to permit the reel 38 to wind the material which has been wound upon the accumulating reel 26 and after the accumulating reel has been unwound, it is moved back to a position near the straightening rolls 36 where it is ready to again act as an accumulating device for the strip when it is again necessary to stop and cut the strip to start it on a new reel.

The controls for operating the several pieces of apparatus shown diagrammatically, such as the pinch rolls 29 and 39, tensioning rolls 28, straightening device 36, reducing rolls 27, shears 41 and 33, welding device 34 and grinding device 35 and reels 37 and 38, may be any control common in the art for manipulating such apparatus and these controls are, therefore, not shown or described in detail.

It will be seen that I have provided a winding reel which may operate to wind a length of material so as to leave the two ends of the material readily accessible which may be used either as a supply reel for a system for providing a continuous length of strip material for a continuously operating reduction mill or as an accumulating reel in a continuously operating reduction mill for accumulating the material as it is continuously delivered from the mill, while parts of the material are being stopped, cut and started on succeeding receiving reels.

In compliance with the requirements of the patent statutes, I have shown and described herein a preferred embodiment of my invention. It is to be understood, however, that the invention is not limited to the precise construction shown and described, but is capable of modification by one skilled in the art, the embodiments herein shown being merely illustrative of the principle of my invention.

I claim as my invention:

1. In a reel for a length of material, a rotatable member, spaced detents carried by and rotatable upon said member, said detents being disposed on opposite sides of the axis of rotation of said rotatable member and so mounted on said rotatable member as to move toward each other to a position to grip the material between the detents when the material is placed between the detents and the rotatable member is rotated.

2. In a reel for a length of material, a rotatable member, spaced detents disposed on opposite sides of the axis of rotation of said member and pivoted on said member about axes which are substantially parallel with the axis of rotation of said rotatable member, said detents being cam shaped and so disposed as to grip the material between the detents when the material is placed between the detents and the rotatable member is rotated.

3. In a device for winding a length of material, a rotatable member, spaced detents carried by and rotatable upon said member, said detents being disposed on opposite sides of the axis of rotation of said rotatable member and being so shaped as to nest together to form a substantially cylindrical reel core.

4. In a device for winding a length of material, a rotatable member, spaced detents carried by and rotatable upon said member, said detents being disposed on opposite sides of the axis of rotation of said rotatable member and so

mounted on said rotatable member as to move to a position to grip the material between the detents when the material is placed between the detents and the rotatable member is rotated, said detents being so shaped as to nest together to form a substantially cylindrical reel core.

5. In a device for winding a length of material, a rotatable member, spaced detents disposed on opposite sides of the axis of rotation of said member and pivoted on said member about axes which are substantially parallel with the axis of rotation of said rotatable member, said detents being so shaped as to nest together to form a substantially cylindrical reel core and being so disposed as to act as cams to grip the material between the detents when the material is placed between the detents and the rotatable member is rotated.

6. In a reel for a length of material, a rotatable member, and means carried by and rotatable upon said rotatable member for engaging the material at a point between the ends of the material whereby, when said rotatable member is rotated the material will be wound from both directions from the point of engagement, and means for so mounting said rotatable member as to facilitate its movement in the direction of movement of the material when one end of the length of material is held substantially stationary and the other end is pulled out to unwind the reel.

7. In a device for winding a length of material, a rotatable member, spaced detents carried by and rotatable upon said rotatable member, said detents being disposed on opposite sides of the axis of rotation of said rotatable member and being so shaped as to nest together to form a substantially cylindrical reel core, and means for so mounting said rotatable means as to facilitate its movement from place to place.

8. The method of providing a continuous length of material to be continuously fed to a work device comprising the steps of winding limited lengths of the material so as to leave both ends of each length accessible and to permit both ends of the length to be unwound simultaneously, holding the trailing end of the material substantially stationary and securing it to the leading end of the next succeeding wound length of material while the material is continuously being fed to the work device as it unwinds.

9. The method of winding lengths of material upon reels as the material is continuously delivered from a work device comprising the steps of substantially stopping the motion of the portion of the material adjacent the reel, cutting the material and starting the material winding on the next succeeding reel while so winding the material which is being continuously delivered from the work device as to permit it to be unwound by said next succeeding reel without cutting the material between the work device and the stopped portion of the material.

10. In a continuously operating work device, means for providing a continuous length of material to be fed continuously to the work device, means for so winding limited lengths of material to be fed to the work device upon reels as to leave both ends of the material upon each reel accessible and to permit both ends to be unwound simultaneously, and means for securing the trailing end of one reel to the leading end of the next succeeding reel while the one reel is unwinding and continuously feeding the work device.

11. In a device for winding a length of material, a base member, a rotatable member mounted on said base member, a pair of cam like members so pivotally mounted on said rotatable member as to have a gripping action on a length of material placed therebetween, means mounted on said base for rotating said rotatable member and roller means on said base whereby said device may be moved from place to place.

GERHARD P. LESSMANN.