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APPARATUS FOR SEPARATING AND REMOVING METAL STRIPS FROM A PILE

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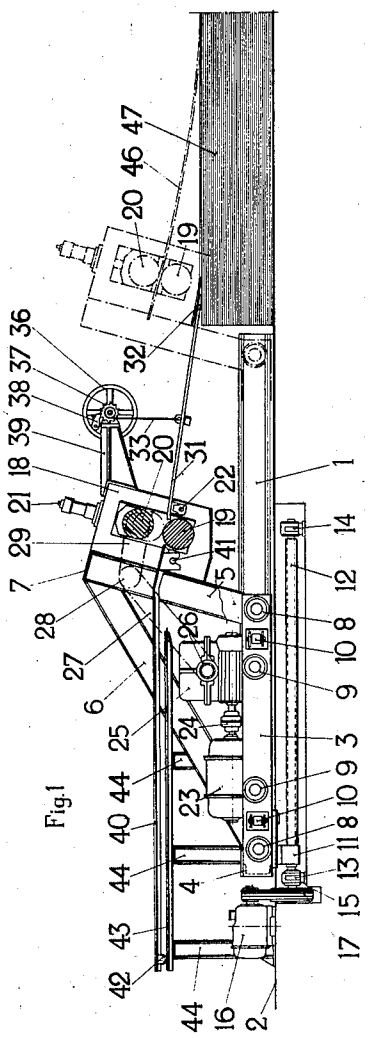


Fig.1

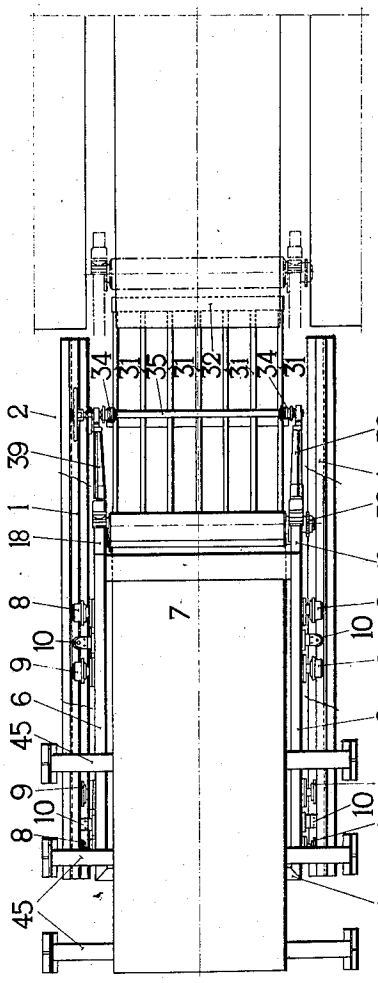


Fig.2

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APPARATUS FOR SEPARATING AND REMOVING METAL STRIPS FROM A PILE

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2 Claims. (Cl. 214—8.5)

The present invention relates to feeding apparatus for the separation and transport in the longitudinal direction at least one strip or band from a pile of strips or bands of ferrous or non-ferrous metals or alloys.

In transport of elongated, relatively wide bands, being for example stored or magazined in the form of a pile or stack, certain difficulties are encountered in separating one strip from the pile or in raising said strip to permit it to be seized and drawn away into its longitudinal direction.

Due to the fact that the strips because of their relatively heavy weight frequently are preferably not handled manually, it is desirable to perform said separation to the greatest extent by means of machine equipment.

The invention, which has for its purpose to provide a feeding apparatus, which renders possible in a convenient and rapid way the separation and raising of one strip and withdrawal of the same longitudinally, is mainly characterized by a slide or carriage movable in the direction of transfer, which slide or carriage is provided with one or more pairs of cooperating rollers.

The invention will be more fully explained hereinafter with reference to an embodiment thereof diagrammatically shown in the accompanying drawings and in connection therewith further characterizing features of the invention will be set forth.

Figure 1 is a side view partially in section of a feeding apparatus embodying the invention.

Figure 2 is a plan view of the feeding apparatus shown in Figure 1.

Designated by reference numeral **1** are two spaced-apart parallel U-beams or the like, which are anchored in one way or another in a base, e. g., a concrete floor **2**. Both of said U-beams, the flanges of which, facing each other, form rails or guides for a carriage, on which the feeding apparatus is arranged. The carriage is built up in the form of a frame comprising two parallel beams **3**, a rear beam **4**, two uprights **5**, two struts **6** and a cross beam **7**. To maintain the carriage in a substantially horizontal position it is provided with four wheels **8** travelling on the bottom flanges of the two U-beams **1**, two wheels on each beam, and with four additional wheels **9** cooperating with the top flanges of said U-beams **1**, two wheels with each flange. To ensure that the carriage will follow a straight path of travel two rollers **10** are mounted on each beam **3** of the carriage for rotation about vertical axes and for cooperation with the web of the relating U-beam **1**.

Fixed to the underside of the carriage is a nut member or the like **11**, into which is threaded a head screw **12**, which is rotatably mounted in bearings **13** and **14** mounted on the base and which at one of its ends carries a pulley **15**, to which power is transmitted from a motor **16** via a number of V-belts or the like **17** and imparts rotational movement in either direction to the head screw **12**. The carriage may thus be caused to move to and fro mechanically upon the beams **1**.

On each side of the carriage a frame **18** is fixed to each upright **5**, which frame carries two pinch rollers **19** and **20**, of which the roller **20** is movable toward and away from the roller **19**. This capability of being moved may obviously be achieved in various ways, e. g., by means of screw devices or the like, but the inventor prefers to use hydraulic or pneumatic means for said displacement due to the fact that in case strips of different thicknesses are to be handled from time to time or that the strip proper may vary in thickness along its length it is important to take such steps that the existing load between the rollers will be equal and independent of the said thicknesses. Thus, in the embodiment shown the adjustment is carried out by means of a pressure medium of any kind, which is supplied, e. g., through the nipple device **21**. which contains suitable pistons and other related equipment known previously.

The roller **20** is driven from an electric motor **23** via a coupling **24**, worm gearing or the like **25**, sprocket wheel **26**, chain **27**, sprocket wheel **28** on the one upright **5**, chain **29** and sprocket wheel **30** arranged on the shaft of the roller **20**.

Pivotally mounted on the roller frame **18** at the points **22** are a number of arms **31**, which at one of their ends are joined by means of knife-like members **32**. The arms **31** as well as the member **32** are retained in their elevated position by means of a wire **33**, which may be coiled upon a wheel or the like **34** on a shaft **35** and that may be turned by means of a hand wheel **36**, so that the wire may either be coiled or uncoiled to raise and lower the arms and the knife-like members **32** respectively. As will be evident from Figure 1, the shaft **35** is provided with a ratchet wheel **37**, with which a pawl **38** cooperates. The shaft **35** and the pawl **38** are mounted on brackets **39** projecting from the roller frame **18**.

Furthermore, a table or the like **40** rests at points **41** on the roller frame **18** and the same table is carried at its other end by idling rolls **42**, which travel on an underlying stationary table **43**, which in turn rests upon beams **44** and **45** attached to the base **2**. Thus, the table **40** may be moved relative to the table **43** in unison with the carriage.

The feeding apparatus embodying the invention operates as follows:

In case the feeding apparatus is used in a magazine plant or the like, in which a plurality of strips or bands, e. g. the strips **46** in Figure 1, are piled upon each other in a pile **47**, from which the same are to be removed, the feeding apparatus is advanced in a direction toward the pile, the arms **31** and the knife member **32** by means of the hand wheel **36**, wheels **34** and the wire **33** being turned to an appropriate level. The end of the uppermost strip is thereafter preferably bent somewhat upwardly by means of a spit or another suitable object, whereby the feeding apparatus is further advanced so that the knife member **32** will occupy the position shown in Figure 1, and upon continued movement the strip **46** is guided, as is indicated in dotted lines, with its end between the rollers **19** and **20**. The rollers are assumed to have been separated before this time by means of the above indicated pneumatic or hydraulic arrangement, so that the introduction of the strip is not prevented during this part of the working operation. When the strip has entered between the pair of rollers the roller **20** may again be lowered, so that the band is pinched and due to the rotation of the roller **20** pulled out of the pile and advanced upon the table **40** and further possibly on a conveyor of any suitable kind, not shown, arranged in continuation of the table. In this way the strips, preferably separated or possibly a plurality at one time, can be pulled away from the pile without requiring any considerable manual

work and furthermore in such a way that the strip is not bulged or distorted in any way.

The invention is not limited to the embodiment shown and described but may be varied in several ways within the scope of the basic inventive idea.

Having now described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. Feeding apparatus for the separation and removal in a desired direction of one or more strips of metal from the top of a pile of such strips, comprising a carriage moveable in the direction in which the strip is to be removed from the pile, said carriage having at its end facing said pile strip separating means projecting therefrom and movable about an axis of rotation common to the planes of separation of the strips comprising the pile and capable of insertion between adjacent strips of the pile upon movement of the carirage in the direction toward the pile, at least one pair of cooperating feed rollers mounted on said carriage for feeding strip removed from the pile and inserted between the rollers, means for moving said feed rollers toward and away from each other to enable the rollers to frictionally grip a strip removed from the pile and means for positively rotating at least one of the rollers to feed a strip introduced between the rollers by the movement of said carriage and the action of said strip separating means.

2. Apparatus as defined in claim 1 in which said strip separating means comprises a plurality of arms projecting from said end of said carriage toward said pile, said arms being connected at their outer ends by a transversely extending knife member adapted to enter between adjacent strips of the pile.

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