April 12, 1955 F. KOCH 2,706,116

INCHING DEVICE

Filed Oct. 26, 1951 2 Sheets-Sheet 1

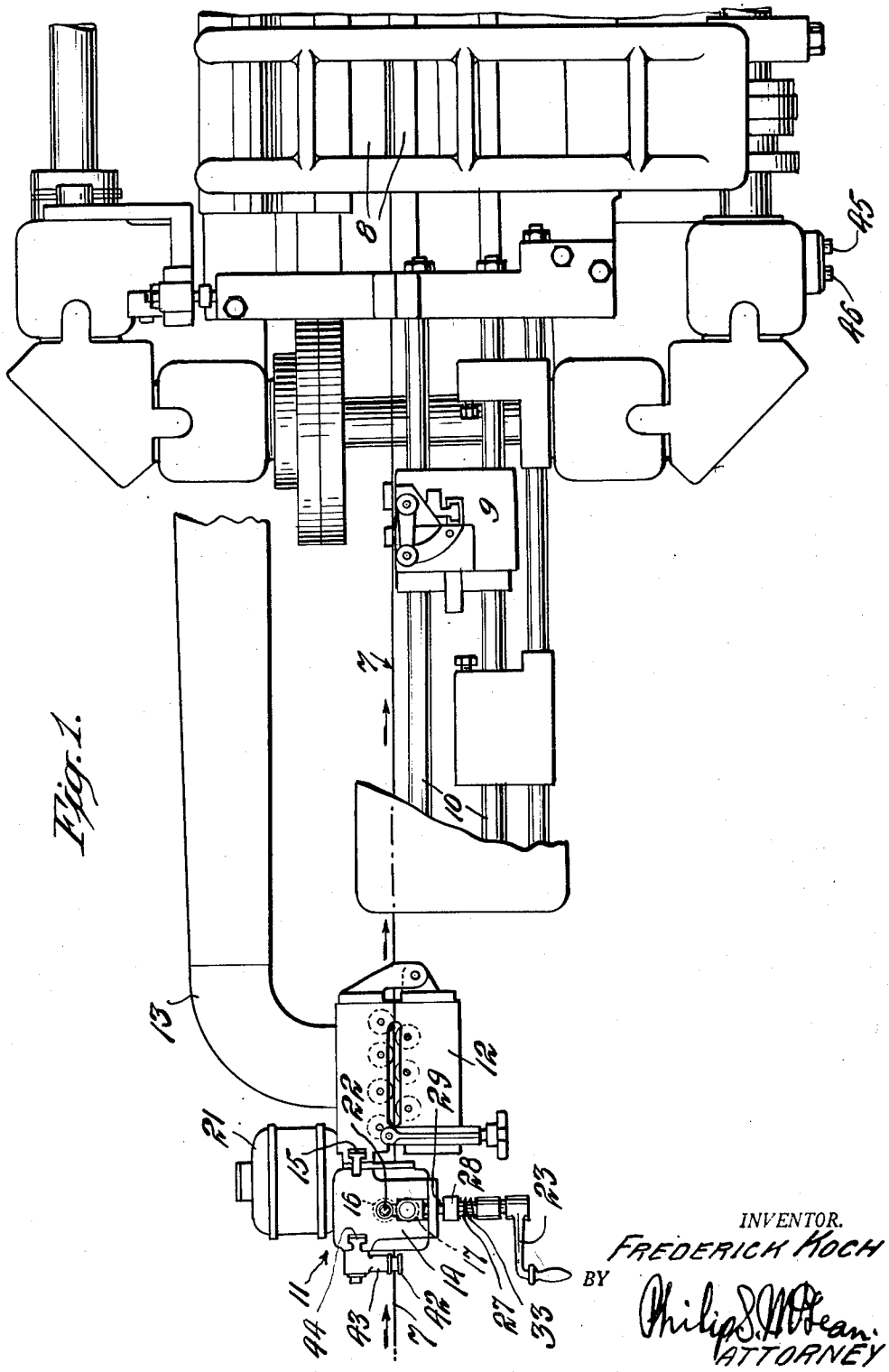


Fig. 1.

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Filed Oct. 26, 1951 2 Sheets-Sheet 2

Fig. 3.

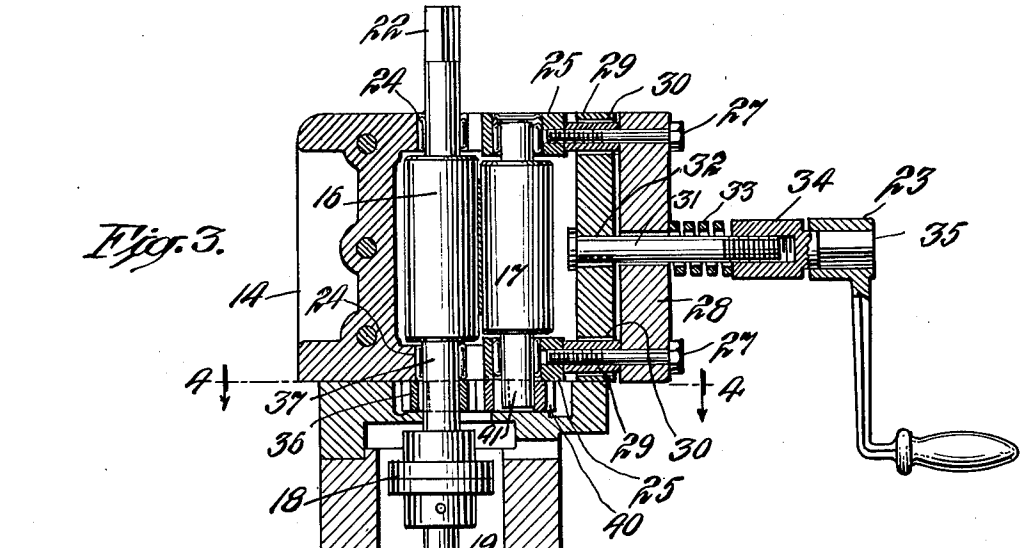
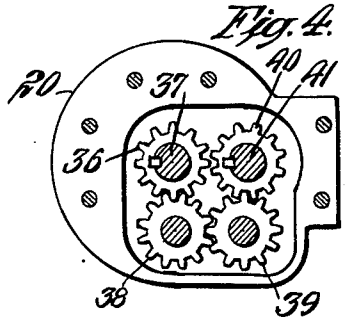


Fig. 4.



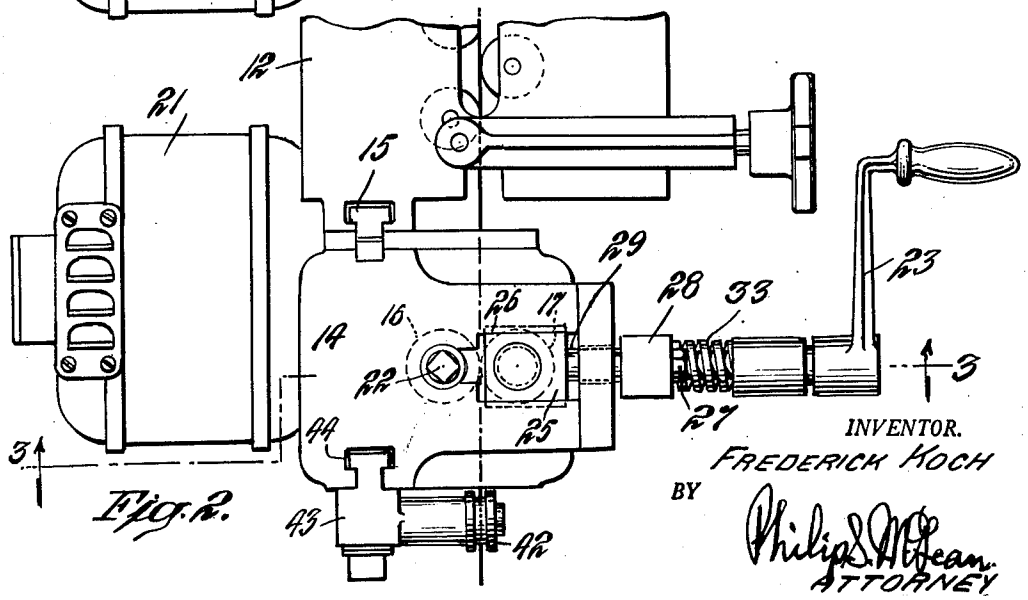


Fig. 2.

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2,706,116

INCHING DEVICE

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2 Claims. (Cl. 271—2.3)

The invention herein disclosed relates to mechanism for adjusting stock in machines of the "Multi-Slide" type, wherein stock is intermittently advanced past a number of successively acting dies.

With these machines, particularly the larger ones handling heavier strip stock and having dies performing more or less complicated operations, difficulties are sometimes experienced in introducing and locating the stock in proper relation to the dies. The machine may be of considerable length and the dies located at some distance from each other and at some distance from the entering end of the machine. With heavy or stiff strip this makes the operation of initially adjusting the stock all the more difficult.

The present invention aims to provide power mechanism readily attachable to "Multi-Slide" or other more or less similar machines and adapted to enable an operator at a position best suited for observing results to advance and retract the stock just as may be required to locate it in proper feeding position in the dies.

Special objects of the invention are to provide such mechanism in a simple, relatively inexpensive form which will not take up much room at the feeding-in end of the machine.

Other special objects of the invention are to provide a power device, of the character indicated, which can be quickly and easily adjusted to the stock being handled and which may be quickly cut into and out of service relation, as required, and particularly be quickly released and put out of action when the machine, after the stock is properly fed in, is started, with its own stock feeding mechanism in operation.

Other desirable objects attained by the invention and the novel features through which the purposes of the invention are accomplished are set forth and will appear in the course of the following specification.

The drawings accompanying and forming part of the specification illustrate a present commercial embodiment of the invention. Actual structure, however, may be modified and changed as regards the immediate illustration, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawings is a broken plan view of the end portion of a "Multi-Slide" machine, showing the invention applied thereto;

Fig. 2 is an enlarged broken plan view of the inching attachment, showing how it is mounted on the end of the straightener of the "Multi-Slide";

Fig. 3 is a broken vertical sectional view as on substantially the plane of line 3—3 of Fig. 2;

Fig. 4 is a horizontal sectional detail showing features of the roller drive gearing on substantially the plane of line 4—4 of Fig. 3.

In Fig. 1 enough of a "Multi-Slide" is shown to illustrate application of the present invention thereto.

In this view flat strip stock is indicated at **7**, advanced to the cutting and forming dies partly shown at **8**, by the feed block **9** sliding on guide rods **10** and reciprocated by crank mechanism, not appearing in this view.

The operation of this slide feed mechanism is well known, the gripper on the slide block taking hold of the stock on the inward movement of the block and releasing its grip on the stock on the outward movement. This mechanism, therefore, operates to feed the stock step-by-step and only in the one direction.

The present invention provides a means for feeding

the stock continuously or intermittently, in either direction and wholly independently of the slide feed.

Briefly, this attachment comprises a pair of pinch rolls which can be set to grip or to be free of the stock, in the latter instance so as not to interfere with operation of the slide feed, a reversible motor for driving said feed rolls in opposite directions, and suitably located controls by which the motor may be started and stopped and driven in opposite directions from a remote point or from some point where operations may be observed and the stock be fed in or withdrawn as conditions may require.

A special feature of this new inching device is that it is made up in a single unit, attachable as such directly to the end of the machine with which it is associated.

In the illustration this unit is indicated generally at **11** in Fig. 1, mounted on the end of the stock straightener **12** which is carried by the supporting arm or bracket **13** forming an integral portion of the machine.

Specifically the inching attachment is shown as comprising a base or frame **14** having a keyed mounting on the end of the straightener, at **15**, Figs. 1 and 2, and having companion stock gripping rolls **16**, **17**, journaled therein, the first of these connected by coupling **18**, Fig. 3, with a shaft **19** driven through reduction gearing, at **20**, from a reversible motor **21**.

The shaft of the first roll is shown extended at the top and squared at **22** to receive a hand crank **23** for enabling the rolls to be turned by hand for extremely small or fine increments of movement in either direction.

The first roll, **16**, is shown journaled in fixed bearings **24** and the second roll, **17**, journaled in blocks **25** slidable in guides **26** toward and away from the fixed roll.

These slidably adjustable journal blocks are shown coupled together by bolts **27** and a cross bar **28**, constituting a yoke through the medium of which the movable roll may be adjusted toward and away from the fixed roll.

Spacer sleeves **29** forming part of the sides of this yoke and disposed between the journal blocks **25** and the cross bar **28**, operate freely through openings **30** in the frame structure.

Movements of the yoke are governed by a bolt **31** extending from the frame at **32** freely through the cross bar **28**, a coiled spring **33** surrounding the outer end of this bolt and bearing against the bar **28**, and a sleeve **34** screwed on the outer end of the bolt and forming an abutment for the outer end of the spring.

The abutment sleeve **34** is shown as having a squared outer end **35** to receive the hand crank **23**, enabling the same to be quickly turned to increase, decrease or entirely release the tension of the spring **33** which is located to thrust the yoke carrying the movable roll toward the relatively fixed roll.

It will be observed in Fig. 3 that by turning the hand crank **23** to screw the abutment sleeve **34** inwardly over the bolt **31**, the spring **33** may be compressed to force the yoke carrying roll **17** toward the other roll, and that upon unscrewing the abutment **34** tension of the spring may be reduced or, if desired, entirely removed, in the latter event permitting the roll **17** to be entirely separated from contact with the stock, this complete separation being possible by pulling outward on the exposed head of the yoke, the bar **28**, after tension of the spring is fully released.

Equal drive of the rolls, through a relatively wide range of separation adjustment, is effected in the illustration through the geared circuit illustrated in Figs. 3 and 4, and comprising a drive gear **36** on the shaft **37** of the stationary roll **16**, in mesh with a companion gear **38** driving a motion reversing gear **39** in mesh with gear **40** on the shaft extension **41** of the adjustable roll **17**. The latter gear is directly opposed to and may be at times or all the time, in mesh with the main drive gear **36**. Regardless of this fact, roll **17** will always be driven through gears **36**, **38**, **39**, **40**, even though the yoke be shifted to fully separate the rolls from engagement with the stock.

The construction disclosed therefore enables the pinch rolls being quickly set by hand crank **23** to engage and feed stock of different thickness or to release grip and leave the stock free for feeding by the slide feed mechanism of the machine.

The stock may be guided in its approach to the feed

rolls between edge guiding rollers **42** carried by bracket **43** adjustably secured on the outer side of the frame **14**, at **44**, Figs. 1 and 2.

Suitable controls for effecting forward and reverse drive of the motor are provided.

These may be in the nature of forward and reverse push-buttons such as indicated at **45**, **46**, located at some point where operations can be conveniently observed. If desired, more than one set of control push-buttons may be provided so that an operator, in introducing the stock, may observe and control operations from different positions about the machine.

The invention has the advantage of being relatively small in size and readily applicable as a unit to the machine, where it will not interfere with other operations, such as the action of a power reel automatically feeding stock, as needed, into the machine.

The mechanism is simple in construction and number of parts and therefore not likely to get out of order or to interfere in any way with any of the usual functions of the machine.

The invention serves, in effect, as an in and out feeding power device which is at hand at all times to advance stock into or to draw it out of the machine, intermittently or continuously and to any required extent and which, as it is not needed, may be opened up so as to leave the machine free to operate as usual with the slide feed or other feed mechanism provided for that purpose.

In machines of the character to which this invention is applicable, the stock feed mechanism, whether it be of the slide feed, roller feed or other type, operates, after feeding in the stock, to leave it free while the dies are acting on it. This freeing of the stock from the regular feed mechanism enables the inching device then to be used to advance the stock, as needed, either in one or the other or in both directions, to suit immediate needs or convenience.

To prevent possible interference between operation of the regular feed mechanism and action of the inching device, suitable interlocking means may be provided to prevent operation of the inching device when the regular feed mechanism is in operation and to prevent operation of the regular feed mechanism when the inching device is set up for action.

What is claimed is:

1. A power inching attachment for inching stock into and out of a machine having its own means for feeding stock through the machine in the normal operation of the machine, said power attachment comprising a base provided with means for mounting it at the stock entering end of the machine behind the stock feeding means present on the machine, in the line of stock feeding movement and thereby adapting it to advance stock into or to pass stock through or to withdraw stock from said stock feeding means when the machine or the stock feeding portion of the machine is in inactive condition, a reversible motor on said base, a pair of pinch rolls on the base, one journaled in fixed bearings and the other journaled in movable bearings shiftable toward and away from the first roll, said rolls being supported by said bearings in the line of stock feed of the machine, drive gearing from the motor to the first roll and gearing from the first roll to the movably mounted roll adjustable to permit movements of the second roll in respect to the first, manually operable control switch means for starting, stopping and running the motor in opposite directions and located in respect to the base at a point where inching results may be observed while operating said control switch means, means on the base for shifting the movably supported roll into cooperative relation with the first roll for inching stock into or passing it through or withdrawing it from the stock feeding means of the machine and for removing said movably supported roll from cooperative relation with the first roll to render said power inching device inoperative and whereby said inching attachment may be used to adjust stock one way or the other in respect to the machine while the stock feeding means of the machine is inoperative and may itself be rendered inoperative when not required to leave the stock feeding means of the machine free to effect feeding of stock to and through the machine in the normal way of operation of the machine, and means for effecting manual operation of said inching attachment comprising a shaft extension on the roll journaled in the fixed bearings, a hand crank removably engageable with said shaft extension and the movable roll having a spring for thrusting the bearings of said roll toward the first roll and an adjustable abutment for said spring, said abutment corresponding in shape to the shaft extension of the first roll and thereby operable by said same hand crank and thereby enabling the pinch rolls to be engaged with or released from the stock, or to be turned in one direction or the other by means of said same hand crank.

2. A power inching device for attachment to a machine equipped with its own means for feeding stock and having a keyway in the end of the machine for supporting a bracket carrying edge guiding rollers for the stock entering the machine, said inching device comprising a base carrying power means and stock feeding rolls driven thereby, and said base having means at one end cooperable with the keyway in the end of the machine and whereby upon removal of the bracket carrying the edge guiding rolls said inching device may be mounted on the end of the machine in place of said bracket, and the base of said inching device having at the opposite end of the same a keyway corresponding to the keyway in the end of the machine and whereby the bracket carrying the edge guiding rolls may be engaged with said keyway on the base and thereby mounted on the end of the base to serve for guiding stock into said inching device prior to entry into the machine.

References Cited in the file of this patent

UNITED STATES PATENTS

1,317,383	Northrop	Sept. 30, 1919
1,448,371	Baehr	Mar. 13, 1923
1,687,524	Smith	Oct. 16, 1928
1,946,170	Mikaelson	Feb. 6, 1934
1,947,015	Littell	Feb. 13, 1934
2,071,076	La Borde et al.	Feb. 16, 1937
2,246,456	Quigley	June 17, 1941
2,349,018	Tasker	May 16, 1944
2,397,833	Borton	Apr. 2, 1946
2,547,828	Maussnest	Apr. 3, 1951

FOREIGN PATENTS

259,205	Great Britain	Jan. 6, 1927