

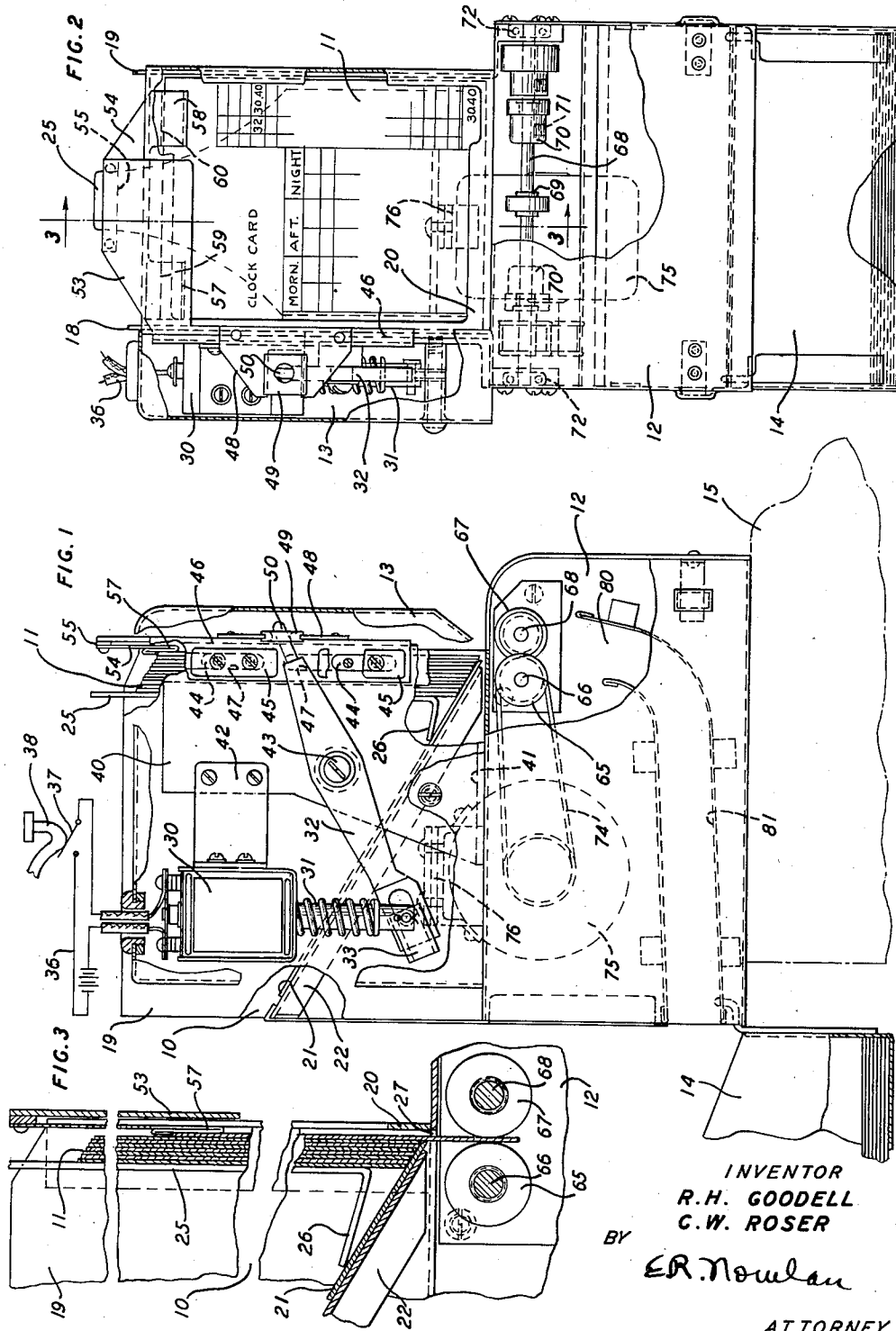
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R. H. GOODELL ET AL

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ARTICLE HANDLING APPARATUS

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ARTICLE HANDLING APPARATUS

Robert H. Goodell, Maplewood, and Carl W. Roser,
Irvington, N. J., assignors to Western Electric
Company, Incorporated, New York, N. Y., a cor-
poration of New York

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This invention relates to an article handling apparatus, and more particularly to an apparatus for successively positioning cards for observation.

In organizations where records are made of data taken from cards such as employee's time cards or work production cards, it has been found, first, that considerable time is required in handling the cards, for example, in removing the card from the stack as the desired data is taken therefrom, second, that reading the data on the cards when in a stacked horizontal position causes fatigue and optical strain to the operator, and, third, the difficulty in reading the data on the cards so positioned frequently causes mistakes in the records.

An object of the invention is to provide a simple, efficient and practical apparatus for successively positioning cards for observation.

With this and other objects in view, the invention comprises a receptacle for a plurality of cards supported to position the first card for clear observation, a set of rollers being driven beneath the first card to rapidly remove it and bring into view the second card when an ejecting mechanism is actuated by suitable means, such as a key of a recording machine, to feed the card to the rollers.

Other objects and advantages will be apparent from the following detailed description when taken in conjunction with the accompanying drawing, wherein

Fig. 1 is a side elevational view of the apparatus, portions thereof being broken away;

Fig. 2 is a front elevational view of the apparatus, portions thereof being broken away, and

Fig. 3 is an enlarged fragmentary sectional view taken along the line 3-3 of Fig. 2.

Referring now to the drawing, it will be observed that the apparatus is composed of four main portions, namely a container 10 for a plurality of cards 11, a base 12 for housing card ejecting rollers and their driving means, a compartment 13 for housing electrically actuated ejecting means, and a receptacle 14 removably attached to the base portion 12 for receiving the cards when ejected.

The apparatus in general is formed of any suitable material, namely sheet metal, the base portion 12 being of the contour shown in Figs. 1 and 2 and mounted upon any suitable support such as a recording machine indicated at 15 in Fig. 1. The term "recording machine" is intended to include any machine which may be

used in recording data. The container 10 is mounted upon the base 12 and includes side walls 18 and 19, an apertured front wall 20, and an angularly positioned bottom portion 21. The bottom portion 21 is supported at each side by angle members 22 fixed to the side walls 18 and 19. The top and the rear of the container 10 are opened for the free insertion of a plurality of cards 11 therein. The angular position of the bottom portion 21 determines the positions of the cards in the receptacle and renders effective a backing element 25 disposed at the back of the cards and provided with transversely projecting leg portions 26 to maintain a vertical position thereof for causing forward movement of all the remaining cards as each card is ejected. Therefore, at all times there is a card positioned adjacent the front wall 20 until, of course, the final or last card has been ejected. The front wall 20, as will be observed by viewing Fig. 2, is cut away, excepting a small portion adjacent its edges, so as to support the cards against further forward movement yet expose for clear observation substantially all the card disposed in engagement therewith, at least all of that portion of the card bearing data. As will be observed by viewing Figs. 1 and 3, all of the cards in the group are supported by the bottom portion 21 of the receptacle excepting the first card, this card being held in place by the force of the element 25 and the remaining cards, forcing it against the front wall 20. Therefore, the front card, although frictionally held in place, is free to be moved downwardly through an elongate passageway 27 (Fig. 3).

The ejecting means is composed of two units, one electrically actuated to cause a quick downward movement of the first card to feed the lower end of the card between ejecting rollers, which rollers complete the ejecting of the card. Attention is first directed to the electrically operated means for starting the movement of the card. This means consists of a solenoid 30 having its core 31 operatively connected to an actuating lever 32 through a slide block 33 and normally urged downwardly by a helical compression spring 34 disposed concentric therewith. The solenoid 30 is included in an electrical circuit indicated generally at 35, which circuit also includes a switch 37. The switch 37 may be of any suitable type actuated in any desired manner. One manner of actuating the switch 37 may be through the actuation of a key 38 of the recording machine 15. This key may be any one of the keys

of the recording machine, a special key for this purpose, or the last key which is operated on the recording machine at the end of each recording of data from each card.

- 5 The solenoid 30 and the lever 32 are supported by a main bracket 40 extending to a position adjacent the front wall 20 and having a lower flange portion 41 secured to the upper surface of the base 12 by any suitable means (not shown).
- 10 A smaller bracket 42 mounted upon the bracket 40 serves to connect the solenoid to the main bracket, while a pivot 43 serves to connect the actuating lever 32 to the main bracket. Elongate guide blocks 44 are disposed in aligned spaced
- 15 positions on the bracket 40. A retaining plate 45 is secured with each guide block to the bracket by the aid of screws or the like. A reciprocating element 46 is angular in cross section, has one portion extending between the bracket 40 and the retaining plates 45 and reciprocable relative
- 20 thereto by the aid of elongate apertures 47, longer than the guide blocks, and positioned therearound. Another portion of the element 46 extends a short distance in front of the front
- 25 wall 20 where it supports a yoke 48 of the contour illustrated in Fig. 2. An apertured bearing member 49 carried by the yoke 48 receives a reduced end 50 of the actuating lever 32, the aperture in the bearing 49 having rounded surfaces to per-
- 30 mit a rocking movement therein of the reduced end. Thus the actuating lever 32 is operatively connected to the reciprocating element 46. The reciprocating element 46 has an integral portion
- 35 53 adjacent the upper end thereof which extends beyond the vertical center line of the front wall 20 for supporting a card engaging element 54. A spacing member 55 positioned between the in-
- 40 tegral portion 53 of the reciprocating element 46 and the card engaging element 54 positions the element 54 adjacent the inner surface of the front wall 20, while the portion 53 is positioned ad-
- 45 jacent the outer surface of the front wall. The element 54 is formed of very thin sheet metal, thinner than can be clearly shown in the drawing yet durable for the purpose intended. By view-
- 50 ing Fig. 2, it will be observed that the element 54 extends slightly less than the full width of the cards 11 and at each end thereof portions 57 and
- 55 58 are provided with double bends closely compressed to form card engaging surfaces 59 and 60, respectively. The cards 11 are presumed to be exact in all dimensions, yet it has been found that there sometimes exists a slight variation.
- 60 This variation, although it is within a few thousandths of an inch, might be instrumental in affecting perfect operation of an ejecting means unless means is provided to allow for such variation in dimensions. Knowing the existence of
- 65 these slight variations in the dimensions of the cards, the card engaging surfaces 59 and 60 are disposed in different planes, the surface 59 being positioned to engage the cards of normal size whereas the engaging surface 60 is positioned in
- 70 a plane thereabove to allow for cards of slightly greater height. As described in the foregoing description, the element 54 is formed of very thin sheet metal and is resilient, causing the portions 57 and 58 to position their card engaging sur-
- 75 faces over the upper edges of the cards as the cards are moved into place.

The heretofore mentioned rollers for continuing the ejecting of the cards are shown in groups of three, one group being indicated at 65 mounted

67 mounted upon a shaft 68. The rollers are formed of any suitable material, such as soft rubber, to provide a positive gripping engagement with the cards and cause a rapid removal of the cards without damaging them. The central rollers of each set are mounted upon metallic hubs 69, which are fixed to their respective shafts, while the outer rollers of each set are mounted upon hubs of the type illustrated at 70 carrying set screws 71 to enable adjustment of the outer rollers upon their respective shafts. The shafts 66 and 68 have their ends supported in bearings 72, the shaft 68 being what may be termed as an "idler" shaft, it being mounted for free rotation, while the shaft 66 is operatively connected through a belt 74 to a driving means such as a motor 75. The motor 75 is suspended from a bracket 76 and is included in an electrical circuit (not shown) to cause operation of the motor continuously while the data from the cards is being recorded or intermittently if desired.

Beneath the rollers 65 and 67 is positioned an inlet opening 80 of a card guide or chute 81, the exit end of which is positioned at an opening in the rear wall of the base 12 adjacent the receptacle 14, wherein the cards 11 are stacked as they are ejected.

Referring now to the operation of the apparatus, let it be assumed that the apparatus is being used in conjunction with a recording machine wherein the operator observes the first card, selects the desired data therefrom, records this data by the recording machine, and at the completion of the recording actuates the key 38 to close the switch 37 and complete the circuit 36 to energize the solenoid 30. Energization of the solenoid causes upward movement of the core 31 against the force of the spring 34, rocking the lever 32 about its pivot 43, causing a rapid downward movement of the reciprocating element 46 a predetermined distance. The reciprocating element 46, being guided by the blocks 44 between the bracket 40 and the blocks 45, is moved downwardly through the actuation of the lever 32 a distance sufficient to move the first card, through the engagement of the surface 59 of the portion 57 of the element 54 with the upper surface thereof, to the position shown in Fig. 3, where the card is moved a suitable distance between the rollers 65 and 67. For the purpose of illustration, let it be assumed that the motor 75 is operating continuously to continuously rotate the roller 65; therefore, as soon as the card is fed to the rollers its rapid downward movement will be continued and directed through the chute 81 and into the receptacle 14. In following the movement of the card from its original position adjacent the front wall 20, through the chute 81 and into the receptacle 14, it will be observed that the card is disposed face down in the receptacle and in this manner the cards will be stacked in the same position they were in when first disposed in the container 10. Referring back to the actuation of lever 32, attention is directed to the fact that the solenoid need be energized only a short length of time, that usually employed in pressing a key, such as the key 38, and releasing the key a reasonable time thereafter. The solenoid is rapid in its action, causing a rapid movement of the first card downwardly, which movement is continued by the rollers so that the first card is removed so quickly the removal is hardly noticeable. The releasing of the key 38 deenergizes the solenoid 30 by opening the switch 37, rendering

effective the spring 34 to return the lever to its normal position shown in Fig. 1.

With the apparatus disposed upon the recording machine or at a convenient position where the first card may be readily observed by the operator of the recording machine, each card, as it is moved into position, may be readily observed by the operator, permitting the operator to assume a comfortable position without causing fatigue or eye strain. Furthermore, all the operator is required to do is to feed stacks of cards to the apparatus, as each card may be removed from sight and stacked in proper order as the data is secured therefrom and immediately upon the removal of one card the next card is disposed in place. With such an apparatus to successively bring the cards into view it is possible for the operator to concentrate entirely on the recording machine and maintain maximum speed in rhythmic sequence uninterrupted by thoughts of care for the cards.

The embodiment of the invention herein disclosed is illustrative only and may be widely modified and departed from in many ways without departing from the spirit and scope of the invention as pointed out in and limited only by the appended claims.

What is claimed is:

1. An article handling apparatus comprising means to support a plurality of cards of predetermined dimensions, an element having a projection positioned to engage the cards when of the predetermined dimensions and a projection positioned to engage cards varying from the predetermined dimensions, and means to actuate the element to eject the cards.

2. An article handling apparatus comprising means to support a plurality of cards for clear observation of a card in first position, ejecting rollers disposed adjacent the first position card for removing the said card when fed thereto, an arm movable to feed the said card between the rollers, and electrically operated means to cause movement of the arm.

3. An article handling apparatus comprising means to support a plurality of cards for clear observation of a card in first position, ejecting rollers disposed adjacent the first position card for removing the said card when fed thereto, a reciprocable element disposed adjacent the said first card, an arm operatively connected to the element, and electrically operated means to actuate the arm to move the element to feed the said card to the rollers.

4. An article handling apparatus comprising means to support a plurality of cards for clear observation of a card in first position, ejecting rollers disposed adjacent the first position card for removing the said card when fed thereto, a reciprocable element disposed adjacent the said first card, an arm operatively connected to the element, electrically operated means to actuate the arm to move the element to feed the said card to the rollers, and means to move the arm to position the element for feeding the next card.

5. The combination with a machine for recording data taken from cards, the machine having a card ejecting key, of means to support a plurality of cards for clear observation of a card in first

position, ejecting rollers disposed adjacent the first position card for removing the said card when fed thereto, and electrically operated means controlled by the said key to feed the said card to the rollers.

6. The combination with a machine for recording data taken from cards, the machine having a card ejecting key, of means to support a plurality of cards for clear observation of a card in first position, ejecting rollers disposed adjacent the first position card for removing the said card when fed thereto, an element movable to feed the said card between the rollers, and electrically operated means controlled by the said key to cause movement of the element.

7. The combination with a machine for recording data taken from cards, the machine having a card ejecting key, of means to support a plurality of cards for clear observation of a card in first position, ejecting rollers disposed adjacent the first position card for removing the said card when fed thereto, an arm movable to feed the said card between the rollers, and electrically operated means controlled by the said key to cause movement of the said arm.

8. The combination with a machine for recording data taken from cards, the machine having a card ejecting key, of means to support a plurality of cards for clear observation of a card in first position, ejecting rollers disposed adjacent the first position card for removing the said card when fed thereto, and electrically operated means controlled by the said key to feed the said card to the rollers.

9. The combination with a machine for recording data taken from cards, the machine having a key, of means to support a plurality of cards for clear observation of a card in first position, an actuable ejecting member disposed adjacent the first position card for removing the said card when actuated, an electrical circuit controlled by the key, and an electrical unit in the circuit to actuate the ejecting member when the said key is moved to close the circuit.

10. The combination with a machine for recording data taken from cards, the machine having a key, of means to support a plurality of cards for clear observation of a card in first position, an actuable ejecting member disposed adjacent the first position card for removing the said card when actuated, an electrical circuit controlled by the key, an electrical unit in the circuit operable when the circuit is closed by the said key, and means actuated by the operation of the electrical unit to actuate the ejecting member.

11. The combination with a machine for recording data taken from cards, the machine having a key, of means to support a plurality of cards for clear observation of a card in first position, an actuable ejecting member disposed adjacent the first position card for removing the said card when actuated, an electrical circuit controlled by the key, an electrical unit in the circuit operable when the circuit is closed by the said key, and an arm operatively connecting the electrical unit to the ejecting member to cause actuation of the ejecting member when the unit is operated.

ROBERT H. GOODELL.

CARL W. ROSER.