

April 19, 1938.

E. W. BILLINGS, JR

2,114,462

ERASING MACHINE

Filed April 20, 1935

. 3 Sheets-Sheet 1

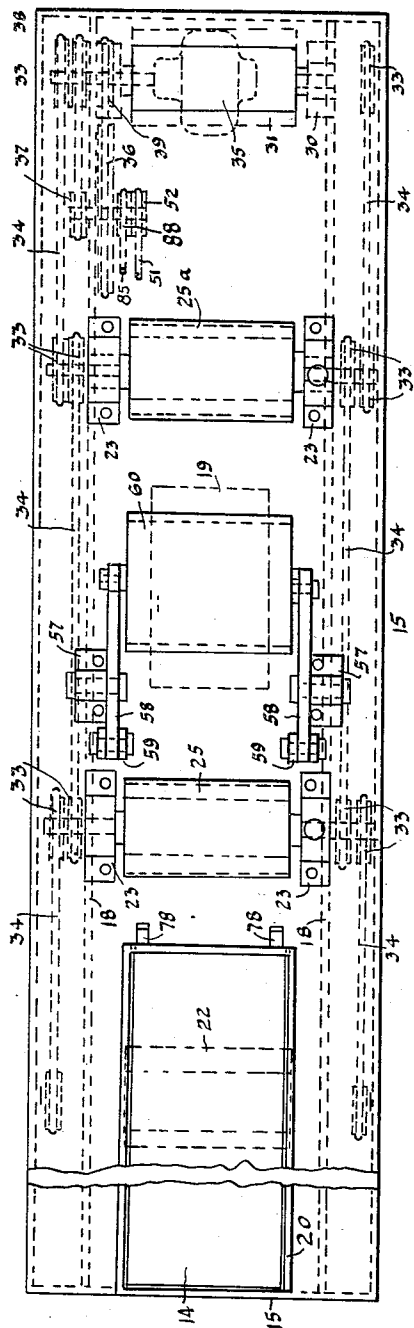


Fig. 1.

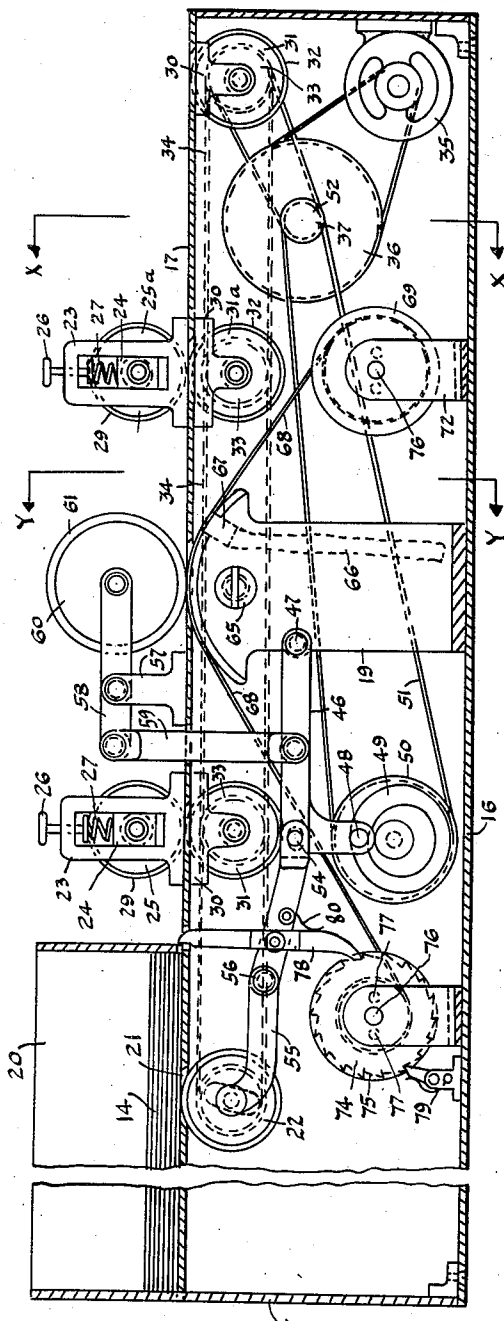


Fig. 2.

BY

INVENTOR
Ernest W. Billings Jr.

F. K. Carwell ATTORNEY

April 19, 1938.

E. W. BILLINGS, JR

2,114,462

ERASING MACHINE

Filed April 20, 1935

3 Sheets-Sheet 2

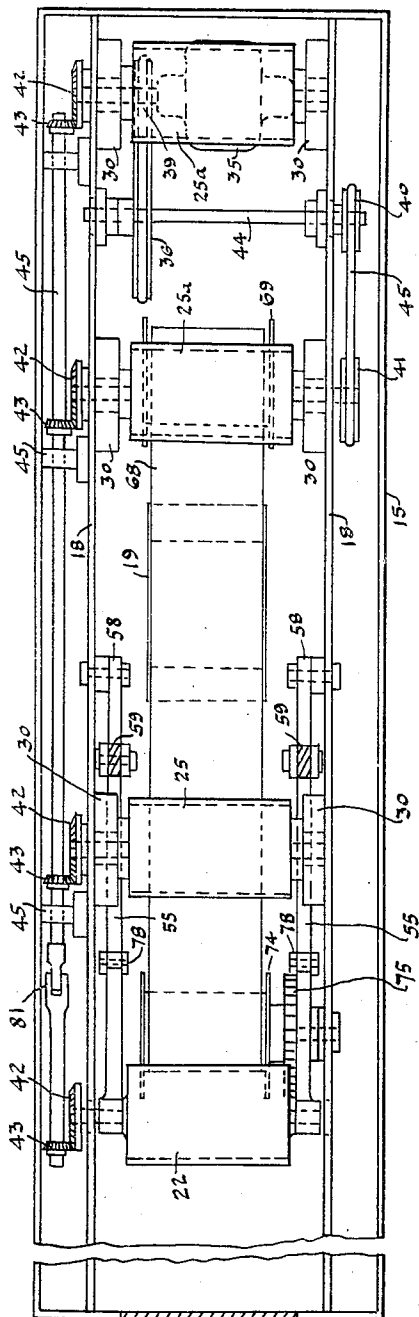


Fig. 3.

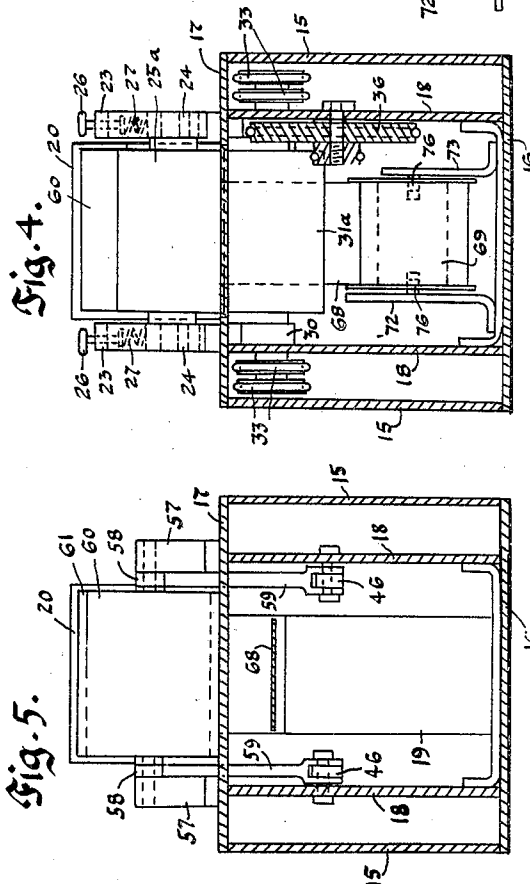


Fig. 4.

Fig. 5.

BY

Ernest W. Billings Jr.

F. K. Carwell

INVENTOR

ATTORNEY

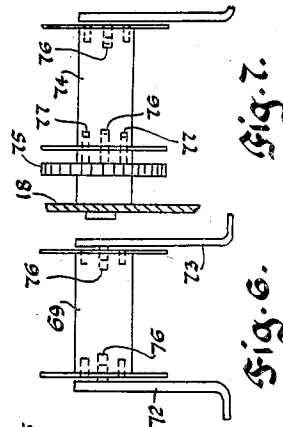


Fig. 6.

Fig. 7.

April 19, 1938.

E. W. BILLINGS, JR

2,114,462

ERASING MACHINE

Filed April 20, 1935

3 Sheets-Sheet 3

Fig. 10.

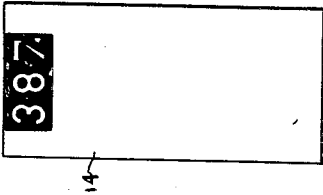


Fig. 11.

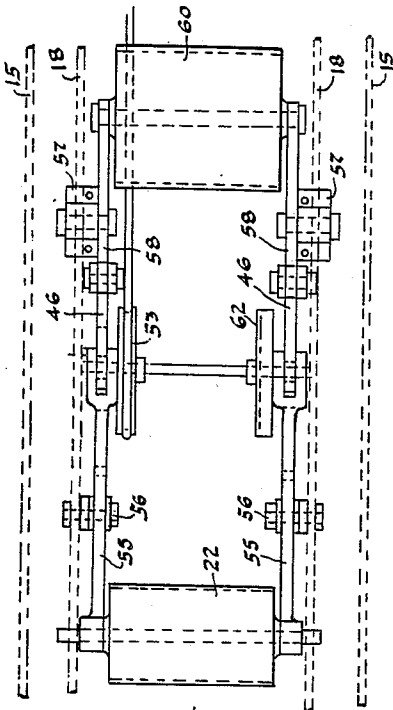
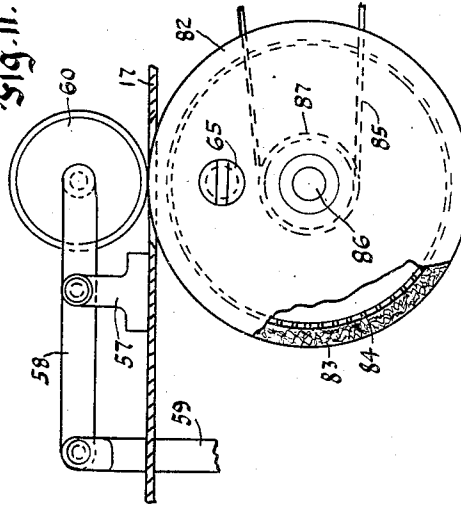
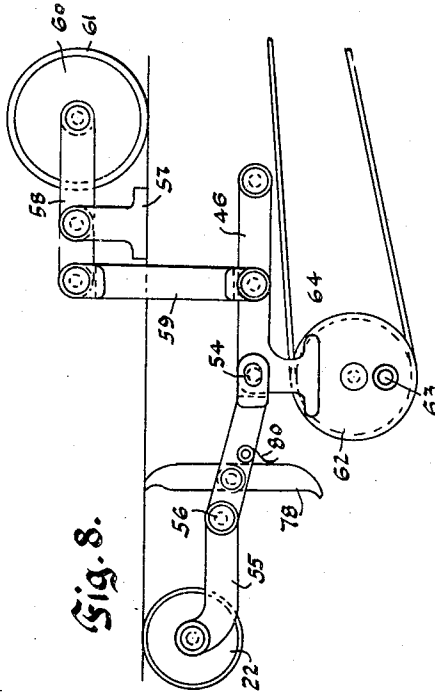


Fig. 9.

Fig. 8.



BY

INVENTOR
E. W. Billings Jr.

F. K. Carwell ATTORNEY

UNITED STATES PATENT OFFICE

2,114,462

ERASING MACHINE

Everett W. Billings, Jr., Los Angeles, Calif.

Application April 20, 1935, Serial No. 17,519

4 Claims. (Cl. 101—1)

My invention relates to a method by which numerals or other printing may be erased preparatory to re-printing and with the object of providing means whereby the cards or other stock may be used repeatedly. In particular this method involves the preliminary printing of an area on the cards with a non-absorbent ink or chemical, preferably of a color in contrast to the color of the card. On this area are printed any desired numerals or other symbols, this printing being done with an ink or other material of a character which can be readily dissolved by the application of a suitable solvent. It will generally be found advantageous to apply this solvent by means of a mechanism which employs simultaneously a pressing and a rubbing action.

Many different mechanical means may be devised to apply the process above outlined, and among these and for the purpose of illustration I have elected to describe the machine shown in the accompanying drawings as one of the practical applications of the above process.

This mechanism relates to that class of machines which are commonly termed "business machines" and is designed to perform certain operations on cards used in connection with machines for compiling statistical data and also for filing and indexing purposes. In many of these business systems cards are used, on which are stamped certain filing or key numbers. This numbering is usually done with a hand numbering machine and the ink generally used in such machines penetrates the material of the card and is practically impossible to erase. The inability to erase or change the number on the card prevents the card from being used more than once, and as some offices use many thousands of such cards monthly, and if the key number could be erased and re-printed as many times as the life of the card stock would permit, great economy would result in the yearly expenditure for such cards.

As a preliminary operation prior to the use of my invention, a dark or black spot is printed on the card, such printing forming a surface on which the key numbers can be printed in white or other contrasting color and preventing the numbering ink from penetrating the material of the card.

The primary purpose of my invention is to provide a machine which will automatically remove or erase the said key figures, thus preparing the card for the re-printing with a new number or symbol. With the means provided by this machine the cards are fed through the machine and

as each card passes through it the numbers are erased, preparing the cards for re-numbering and enabling the cards to be used repeatedly.

While I have not shown any detailed method of re-printing of the numbers, it is my intention to add to the machine a numbering device which will re-number the cards after the erasure of the old number has been made.

My invention has several distinct functions and suitable mechanisms for producing the same. First: A receptacle is provided in which the cards to be erased are stacked. Second: An intermittent card stop which releases one card at a time. Third: An intermittent feed mechanism which feeds one card at a time out of the receptacle and on through the erasing mechanism. Fourth: An erasing mechanism, including a pressure roll. Fifth: A ribbon which is moistened with an erasing solvent, and which advances as each card is fed through so as to present a freshly moistened surface as each card passes between the ribbon and the pressure roll. If desired a brush or swab may be provided to clean the ribbon after each erasure.

I illustrate my invention by means of the accompanying drawings in which: Figure 1 is a top plan of the machine. Figure 2 is a side elevation with the front of the case and the adjacent septum removed. Figure 3 is a top plan with the cover plate removed. Figure 4 is a cross-section taken on the line X—X in Figure 1. Figure 5 is a cross-section taken on the line Y—Y in Figure 1. Figure 6 is a detail showing the method of supporting the ribbon. Figure 7 is a detail showing the method of actuating the ribbon. Figure 8 is a detail side elevation of the intermittent feed and pressure roll mechanism and also shows an alternate construction of the actuating mechanism. Figure 9 is a plan view of Figure 8. Figure 10 is a view of the card with the dark spot and a key number before erasure. Figure 11 is a side elevation of a moistening roll which may be used instead of a ribbon. Similar figures refer to similar parts in the several views.

The construction of my device is as follows:

The mechanism is enclosed in a case 15, having a removable bottom plate 16 and a cover plate 17. Within the case 15 are two longitudinal septums 18, designed to furnish a means of attachment for the various parts. The bottom plate 16 is removable to provide access to the ribbon and other parts, and to the tank 19 containing the solvent. On top and at one end of the cover plate 17 is a receptacle 20 adapted to receive a number of the cards 14 stacked one above another.

Under the receptacle 20 is an aperture 21 which permits the intermittent feed-roll 22 to contact the bottom card. Mounted on top of the cover plate 17 are the feed-roll jaws 23 having adjustably mounted therein the journals 24 of the feed-rolls 25 and 25a. The degree of pressure is regulated by the screws 26 and the springs 27. The feed-rolls 25 and 25a are covered with a friction material 29 such as rubber. Underneath the cover plate 17 are the brackets 30 in which are journaled the feed-rolls 31 and 31a, which are also covered with friction material 32. The feed-rolls 31 and 31a are so located that their peripheries contact the under side of the feed-rolls 25 and 25a, through apertures in the cover plate 17. Rotatably mounted on the shafts of the feed-rolls 31 and 31a are secured the pulleys 33. The pulleys 33 are connected to each other and driven by the belts 34. These pulleys and the under feed rolls may be driven by various means, but as shown in Figure 2 the driving mechanism consists of a motor 35 and a drive pulley 39 belt-connected to a speed reduction pulley 36 and the pulleys 37 and 38. In the gear drive mechanism shown in Figure 3, the motor 35 drives the pulley 36 by means of the pulley 39. On the same shaft 44 with the pulley 36 is a pulley 40 which drives the pulley 41 by means of the belt 45. The pulley 41 is secured to the feed-rolls 31 and 31a, and secured to the opposite end of the said feed-rolls are bevel gears 42. Each of the feed-rolls 31 and 31a are similarly provided with bevel gears 42 which mesh with the bevel pinions 43, the latter being mounted on the shaft 45. The extension of the shaft 45 which drives the intermittent feed-roll 22 is provided with a universal joint 81.

The intermittent feed mechanism consists of the lever arms 46, fulcrumed at 47 to the septums 18, and carrying a pin or roll 48 adapted to function in the slot 49 of the cam 50. The said cam is driven by a belt 51 from the pulley 52 which is on the same shaft with the pulley 36. At the ends of the levers 46 adjacent to the cam a pin 54 engages a slot in the clevised ends of the intermittent feed-roll levers 55. These levers are fulcrumed on the septums 18 at the point 56 and at the other extremity have journaled therein the intermittent feed-roll 22, which intermittently contacts the cards through an aperture 21 in the cover plate 17. Mounted on the cover plate 17 are the brackets 57 having fulcrumed therein the levers 58; one end of the said levers being connected to the levers 46 by means of the link 49, the other ends having journaled therein the pressure-roll 60. This roll is covered with a friction material having a slight degree of compressibility.

In the modified form of the intermittent motion as shown in Figure 3 the cam 50 is omitted and instead there is a disc 62 carrying a pin and roller 63 which as it is rotated engages the foot 64 which is integral with or attached to the levers 46.

The erasing mechanism includes a receptacle 19 located directly under the pressure roll 60. It is provided with a curved top which contacts the said pressure-roll through an aperture in the cover plate 17. This receptacle is intended to contain a solvent suitable to dissolve the ink or other material to be erased from the cards. The receptacle 19 is also provided with a filling plug 65, and a wick 66 which is at least partially immersed in the solvent and which is held in place within a tube 67 in such a manner as to

cause the upper end of the wick to contact the under side of the ribbon 68, the wick drawing up the solvent by capillary attraction and moistening the ribbon as it passes over it. The ribbon spools 69 are so designed as to permit the end of the ribbon to be hooked or otherwise attached to the cylindrical core of the spool. The spool 69 has a central hole 70 on each end designed to receive trunnions, and also two other small holes 71 adapted to receive two pins by which the spool is rotated. The spool from which the ribbon is unwound is mounted between two brackets, each of which is provided with a trunnion 76 adapted to engage the central hole 70 of the spool. One of these brackets 72 is made of stiff metal and the other, 73, of spring metal and can be bent back to permit the insertion of the spool 69. The spool 74 is the same as spool 69 but is mounted differently. Journaled in the septum 18 is a ratchet 75 which is provided with a trunnion 76 and two pins 77 adapted to engage the corresponding holes in the spool. The mounting bracket on the other side of the spool 74 is of spring metal and has a trunnion 76 to engage the other side of the spool. The ratchet 75 is actuated by the pawl 78 which is mounted on and actuated by the lever 55. The said ratchet is prevented from unwinding by the pawl 79. The pawl 78 is held in position against the ratchet by the spring 80.

The card stop and release consists of the upper ends of the lever 78, which being mounted on the levers 55 rise and fall through an aperture in the cover plate 17, engaging or disengaging with the edges of the cards 14.

In the modified form of the erasing mechanism shown in Figure 11, the ribbon, spools and spool-holders are omitted. Also the ratchet 75, pawl 79 and the lower part of the lever 78 are omitted. In place of having a receptacle such as the tank 19 for the solvent, a drum is substituted. The drum 82 is located directly under the pressure-roll 60 and consists of a cylinder 84 having very small perforations but with solid ends, and having its periphery covered with an absorbent material 83, such as felt, which becomes moistened with the solvent. The drum 82 is designed to contain a solvent such as would be used with the tank 19. A filling plug 65 is also provided. The drum 82 has trunnions 86 which are journaled in the septums 18 and the drum is rotated by the belt 85 acting on the pulley 87. The belt 85 is driven by the pulley 88 as shown in Figure 1.

The operation of my device is as follows:

The machine having been assembled as shown and described, the solvent receptacle supplied and the ribbon in place, the cards on which the erasure is to be made are placed in the card holder 20 with the dark spot and figures on the underside or next to the cover plate 17. On starting the motor the pulleys and belts, or the pulleys and gear drive, set in motion the lower feed-rolls 31 and 31a, and the intermittent feed-roll 22. The belt drive to the cam 50 or to the disc 62 and pin 63, set these elements in motion and with each revolution raise the lever 46, which in turn depresses the lever 55 and the intermittent feed-roll 22. The card stop lever 78 is raised holding the cards in the holder. When the cam 50, or the disc 62, has made a half-revolution the lever 46 is depressed, the card stop lever 78 withdrawn downwardly sufficiently to release one card, and the intermittent feed-roll 22 raised, thus contacting the underside of the bot-

tom card in the holder 20. The rotation of the feed-roll 22 bearing against the bottom card feeds the card forward, and in its passage engages the feed-rolls 25 and 31. The card also passes between the pressure-roll 60 and the ribbon 68. The mechanism is so timed in relation to the speed of the card feed and the rotation of the cam that when the dark spot and figures on the underside of the card almost reach the pressure-roll and ribbon, the cam has raised the lever 46, and by means of the link 59 and the lever 58 has depressed the pressure-roll 60 so that considerable pressure is exerted between the card and the moist ribbon. The outer feed-rolls 25a and 31a have then gripped the card and pulled it between the pressure-roll and the ribbon, the pressure causing the moisture in the ribbon to erase the light colored figures from the card. At the same time when the pressure-roll 60 is depressed the intermittent feed-roll 22 is also depressed and the card stop 78 raised, thus preventing the second card from leaving the holder until the next half-revolution of the cam raised the pressure-roll.

25 The operation of the modified method of erasing by means of a solvent drum is that the drum 82 is rotated continuously with the solvent moistened felt covering 83 contacting the bottom of the cards as they pass through.

30 What I claim as my invention and desire to secure by Letters Patent is:

1. The method of preparing cards for use in a machine of the class described, said method consisting of printing an area on said cards with ink which when dry is non-absorbent, and printing

on the said area with a suitable substance which is adapted to be erased by the application of a suitable solvent applied by a machine simultaneously with mechanical pressure.

2. An erasing process consisting of coating a pre-determined area on cards with a moisture-proof medium, placing on said area superimposed characters or numerals consisting of a non-penetrating pigment, and erasing from said cards and predetermined moisture-proof area the said characters or numerals, the erasure being accomplished as by a machine adapted to exert friction combined with the application of a solvent adapted to remove said pigment.

3. An erasing process consisting of machine coating a pre-determined area on cards with a moisture-proof medium by means of a machine, placing on said area characters or numerals by means of a non-penetrating pigment applied by said machine, and erasing from said cards, one at a time as by the use of said machine, the said characters or numerals, the erasure being accomplished by combined friction and the application of a solvent adapted to remove said pigment.

4. A process for erasing pigmented characters or numerals which have been placed on a moisture-proof area of cards, said process consisting of the use as by a machine to apply solvent combined with friction to said area of each card for the purpose of erasing said pigmented characters or numerals.

EVERETT W. BILLINGS, JR.