June 10, 1952 O. B. MEYERS 2,600,068

DEVICE FOR REMOVING INDIVIDUAL SHEETS FROM A STACK

Filed Feb. 19, 1949

Fig. 1.

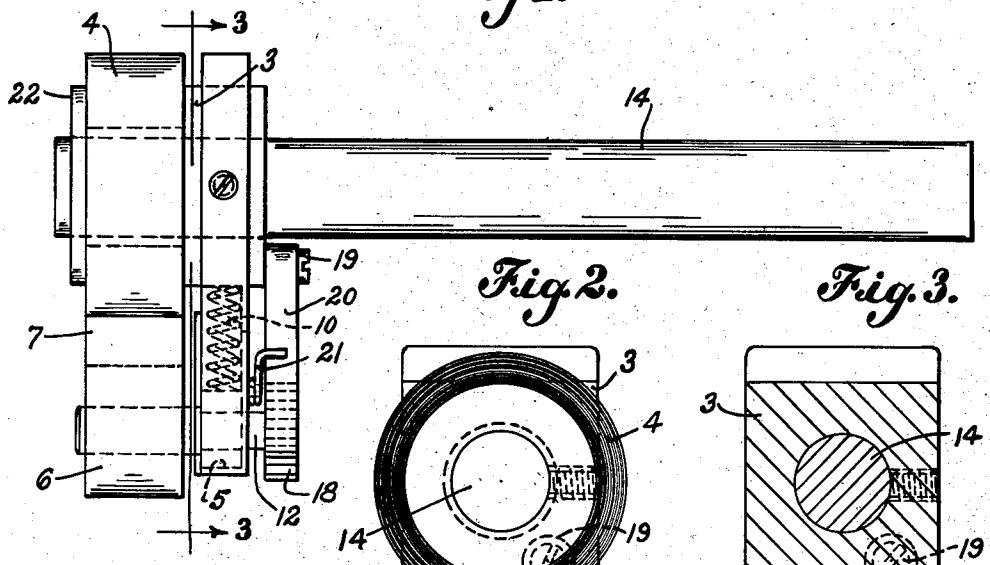


Fig. 2.

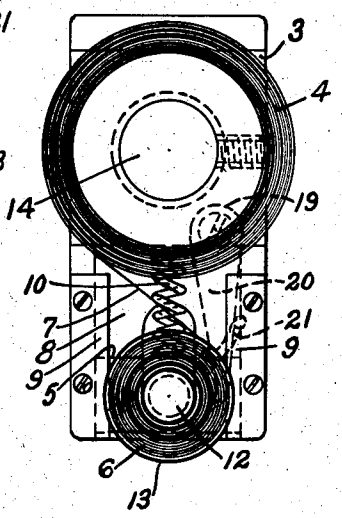


Fig. 3.

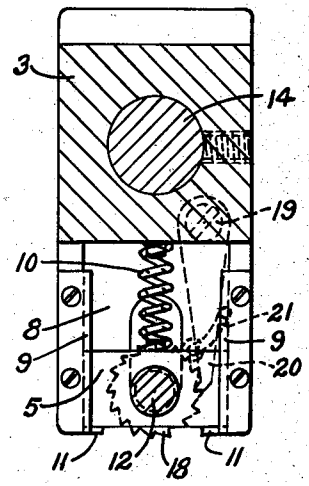
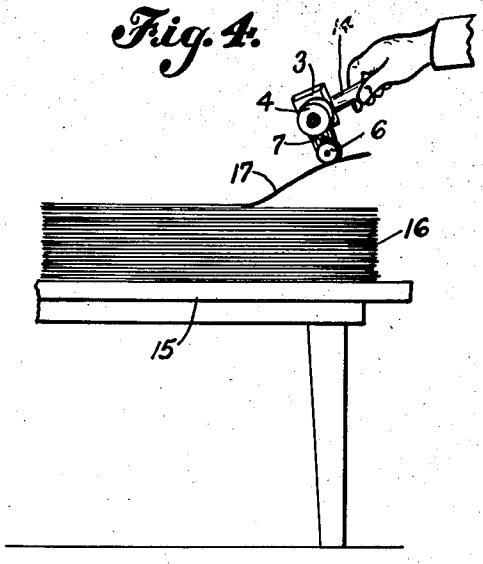


Fig. 4.



INVENTOR.
Otto B. Meyers.
BY Heard Smith & Tennant
attorneys

Patented June 10, 1952 2,600,068

UNITED STATES PATENT OFFICE

2,600,068

DEVICE FOR REMOVING INDIVIDUAL SHEETS FROM A STACK

Otto B. Meyers, Quakertown, Pa., assignor to Markem Machine Company, Keene, N. H., a corporation of New Hampshire

Application February 19, 1949, Serial No. 77,304

4 Claims. (Cl. 294—1)

1

This invention relates to a pickup device for separating and removing the top sheet from a pile or stack of sheets.

There are various manufacturing operations which involve marking individual pieces which ultimately form part of a completed article, and when such pieces are in sheet form, it is a common practice to do this by means of a marking machine, in which case a pile or stack of such sheets to be marked is placed on the bed or platen of a marking machine so that at each downward operative movement of the printing head the latter will make an imprint on the top sheet, and as each sheet is thus marked, it is peeled off or removed from the top of the pile thereby exposing the next sheet underneath for the marking operation.

If the sheets being marked are made of paper or some other sufficiently non-porous material, the removal of each sheet from the top of the pile as it is marked can be successfully accomplished by means of suction cups or the like, but if the material operated on is cloth or some other relatively porous material, suction cups are not practical for this purpose.

In the garment industry it is customary to mark various garments such as collars, shirts, underwear, etc., with some notation indicating the size of the garment, and the marking is frequently done on pieces of cloth before they are made up into the complete garment. Such pieces of cloth to be marked are generally arranged in a pile, which may contain two or three hundred sheets or pieces, and placed on the bed of the marking machine so that at each operation of the machine the top piece or sheet of the pile will be suitably marked. The removal from the top of the pile of each piece or sheet of cloth as it is marked is usually done by hand, the operator seizing or picking up the top piece on the pile as soon as it is marked and flipping it back out of the way and removing it from the pile thereby exposing the next sheet for marking at the next operative movement of the printing head.

The operator's speed limitation in thus picking up the top marked sheet and removing it from the pile depends upon her adeptness in seizing the top piece of cloth between her fingers and pulling it back and thus removing it from the pile.

Moreover it sometimes happens that an operator will grasp the top two sheets or pieces instead of the top piece only and will thus remove from the stack not only the marked piece but also an unmarked piece.

2

It is one of the objects of my present invention to provide an improved pickup device which can be used for thus picking up and removing from a pile the top sheet as it is marked, which is capable of operation at a higher speed than that usually attained by an operator who is performing this operation by seizing the top sheet with her fingers.

Another object of the invention is to provide a device for this purpose which at each operation will lift and remove only a single sheet from the top of the stack or pile.

These objects are attained by means of a pickup device which is equipped with a pressure sensitive adhesive pickup material such for instance as Scotch tape, which pressure sensitive adhesive material is so arranged that by bringing the pickup device into pressure contact with the piece of cloth to be picked up, there will be sufficient adhesion between the cloth and the pressure sensitive adhesive tape to lift the top piece only and remove it from the pile. Such pickup device may be arranged to be operated automatically as a part of the machine or it may be operated manually by the machine attendant. In either case, however, the speed at which the device may be operated to successfully pick up a single sheet only from the top of the pile and remove it therefrom is greater than the speed which can be normally acquired by an operator who has to perform this operation by grasping the top sheet with her fingers in order to lift it from the pile and remove it.

In order to give an understanding of my invention, I have illustrated an embodiment thereof in the accompanying drawings which will now be described, after which the novel features will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a side view of a device embodying my invention which is designed for hand manipulation.

Fig. 2 is an end view thereof looking from the left, Fig. 1.

Fig. 3 is a section on the line 3—3, Fig. 1.

Fig. 4 is a view illustrating the manner in which the device is used.

The device herein shown comprises a head member 3 which is constructed to have mounted thereon a roll 4 of pressure sensitive adhesive tape 7, said roll being arranged as usual with the non-adhesive face of the tape on the outside and for convenience being referred to as the delivery roll.

Associated with the head 3 is a foot member

5 which is also constructed to support another roll 6 of pressure sensitive adhesive tape onto which the tape 7 is rewound as it is taken off from the roll 4. Such rewinding is done in such a way that the tape on the roll 6 will have its adhesive face on the outside.

The head 3 is provided with an extension 8 having ways 9 in which the foot 5 is received, said foot being capable of moving in said ways toward and from the head 3. The foot 5 is acted on by a spring 10 which is located between said foot and head 3 and which normally tends to move the foot away from the head, the extension 8 being provided with stop shoulders 11 which limit the spring impelled movement of the head 5. The rewind roll 6 is herein shown as mounted on a shaft 12 which extends through the foot 5 and is so positioned that the lower portion of said roll 6 projects beyond the bottom of the foot and is thus exposed for engagement with the top sheet of a pile of sheets. When the exposed adhesive face 13 of the pressure sensitive adhesive tape on the roll 6 is brought into pressure contact with the top sheet, its adhesion thereto will lift the top sheet from the pile when the device is raised.

As stated above this pickup device may be either operated automatically or manually, and as herein shown the head 3 is provided with a handle 14 by which the device can be manually manipulated as illustrated in Fig. 4.

Said Fig. 4 illustrates a bed 15, which may be the bed or platen of a marking machine, on which is a pile 16 of pieces of cloth which are to be marked, the top piece being indicated at 17.

In using the device the operator will bring the exposed adhesive face 13 of the pressure sensitive adhesive tape into pressure contact with the top sheet 17 of the pile 16 as soon as said sheet has received its imprint from the marking machine, and while the printing head is being raised and then lowered again for another printing operation, the operator will, by a quick and adept movement, move the pickup device with its attached top sheet 17 backwardly thereby removing said sheet from the pile.

The removed sheet may be easily stripped from the pickup device by a quick jerking movement thereof or by applying a pulling force to the sheet or piece to disengage it from the pressure sensitive adhesive tape.

Inasmuch as the operator does not have to perform the operation of pinching or grasping the top sheet for thus removing it, she is able to make the necessary downward and backward movement of the pickup device for removing the top sheet at an increased speed.

Since the pickup device herein shown has adhesive contact with the top sheet only, said top sheet will be the only one which will be removed from the pile and thereby all danger of accidentally removing a second sheet with the top printed sheet is avoided.

In order that the device may operate satisfactorily and accurately for long periods of time, means are provided whereby at each operation of the device the rewind roll 6 will be turned forward slightly to withdraw a small increment of tape from the delivery roll 4, and in this way a fresh portion of the adhesive face of the tape will be presented at the bottom of the roll 6 at each operation of the device.

For this purpose the shaft 12 on which the rewind roll 6 is mounted has fastened thereon

a ratchet wheel 18 and the head 3 has pivotally mounted thereon at 19 a feed pawl 20 which cooperates with the ratchet 18, said pawl being acted on by a suitable spring 21 which holds it yieldingly in engagement with said ratchet.

Each time that the device is moved downwardly against the top sheet 17 of the pile, the pressure contact of the device against the sheet will move the foot 5 backwardly slightly against the action of the spring 10, and during this backward movement the engagement of the pawl 20 with a tooth of the ratchet 18 will give the shaft 12 and the rewind roll 6 thereon a slight forward turning movement. For practical purposes it is sufficient if this forward feeding movement is such as to feed the tape 7 forward about 1/64 of an inch at each operation, although the amount of feed may be varied by varying the number of teeth on the ratchet without in any way departing from the invention.

While I have illustrated one embodiment of the invention yet I desire to state that said invention is not limited to the particular structure illustrated as the important feature thereof is a pickup device which embodies pressure sensitive adhesive tape for lifting and removing the top sheet from a pile of sheets.

While the invention is especially applicable for use in removing pieces or sheets of cloth from a pile or stack, yet it is equally applicable for removing pieces or sheets of other material.

I claim:

1. A pickup device for removing individual sheets from a stack of sheets comprising a head, a delivery roll of pressure sensitive adhesive tape mounted thereon, a foot member supported by the head, a shaft carried by said foot member, a rewind roll mounted on the shaft on which said tape is rewound from the delivery roll with the adhesive face of the tape on the outside thereof, means mounting said foot member for movement toward and from the head, a spring resisting the movement of the foot member toward the head whereby when the exposed face of the pressure sensitive adhesive tape is pressed against said sheet to be lifted the head is retracted slightly, a ratchet on said shaft and a pawl carried by the head and engaging said ratchet and operative to turn the ratchet and the shaft an increment at each operative movement of the foot member.

2. A pickup device for removing individual sheets from a stack of sheets comprising a head, a delivery roll of pressure sensitive adhesive tape mounted thereon, a foot member beneath said head, a shaft carried by said foot member, a rewind roll mounted on said shaft on which said tape is rewound from the delivery roll with the adhesive face of the tape on the outside thereof, said shaft being positioned to support said rewind roll with a portion thereof exposed below the foot member, means yieldingly supporting said foot member on the head for movement toward and from the latter in a direction at right angles to the axis of the shaft, and means operated by the backward yielding movement of the foot member when the exposed portion of the rewind roll is pressed against the top sheet of the stack of sheets to advance said rewind roll slightly and thus wind thereon an increment of tape from the delivery roll.

3. A pickup device for removing individual sheets from a stack of sheets comprising a head, a delivery roll of pressure sensitive adhesive

tape mounted thereon, a foot member supported by the head beneath the latter, a shaft carried by the foot member, a rewind roll mounted on said shaft on which tape delivered from the delivery roll is rewound with the adhesive side of the tape exposed on the outside thereof, said shaft supporting the rewind roll with a peripheral portion thereof projecting below said foot member and in position to be brought into engagement with the sheet to be picked up, said foot member being movable toward and from the head in a directon at right angles to the axis of the rewind roll, a spring acting on said foot member and resisting movement thereof toward the head and holding the rewind roll yieldingly in operative position, whereby when the head is manipulated to bring the rewind roll into pressure contact with the top sheet of the stack of sheets, a foot member will yield upwardly against the action of the spring, and means operated by such yielding movement to give the rewind roll a slight turning movement, thereby to wind an increment of the adhesive tape thereon.

4. A pickup device for removing individual sheets from a stack of sheets comprising a head, a delivery roll of pressure sensitive adhesive tape mounted thereon, a foot member beneath said head, a shaft carried by said foot member, a

rewind roll mounted on said shaft on which said tape is rewound from the delivery roll with the adhesive face of the tape on the outside thereof, said shaft being positioned to support said rewind roll with a portion thereof exposed below the foot member, means yieldingly supporting said foot member on the head for movement toward and from the latter in a direction at right angles to the axis of the shaft, and means operated by the backward yielding movement of the foot member when the exposed portion of the rewind roll is pressed against the top sheet of the stack of sheets to advance said rewind roll slightly and thus wind thereon an increment of tape from the delivery roll, and a handle connected to the head by which the device may be manipulated.

OTTO B. MEYERS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
602,948	Kunkle	Apr. 26, 1898
1,648,115	Dickman et al.	Nov. 8, 1927
2,351,367	Rider	June 13, 1944
2,423,962	Clark et al.	July 15, 1947