April 30, 1957 R. H. WHARTON 2,790,742

METHOD OF MAKING A TRANSFER

Filed Sept. 27, 1952

Fig. 1

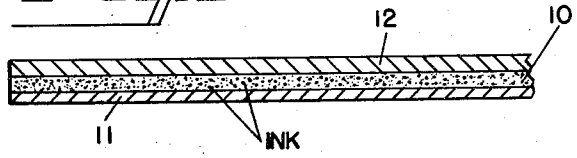


Fig. 2

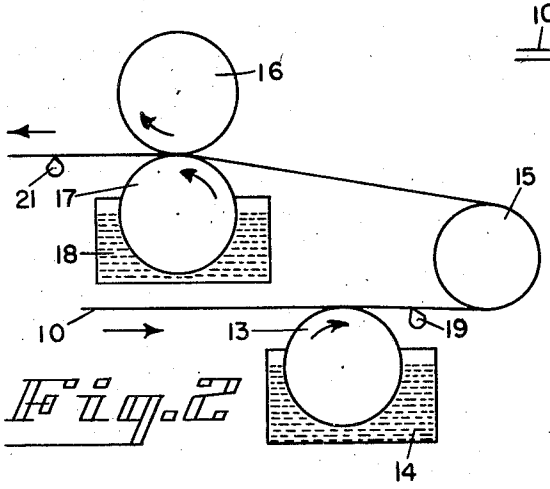


Fig. 4

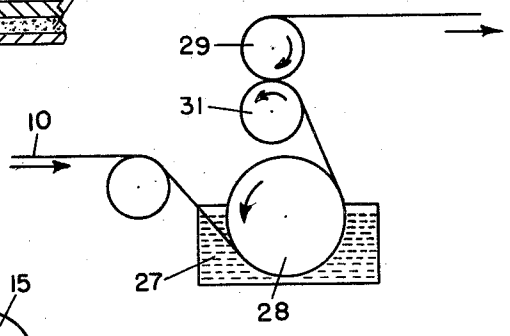


Fig. 3

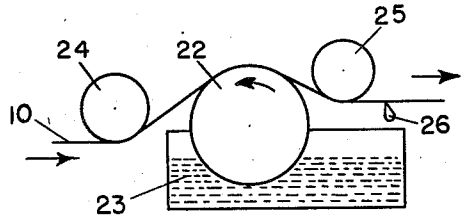


Fig. 5

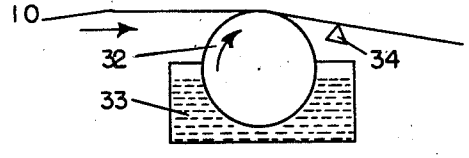


Fig. 6

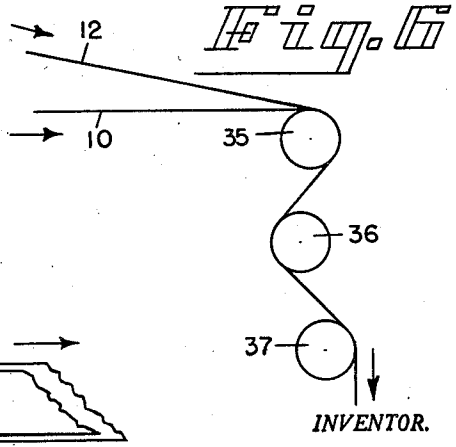
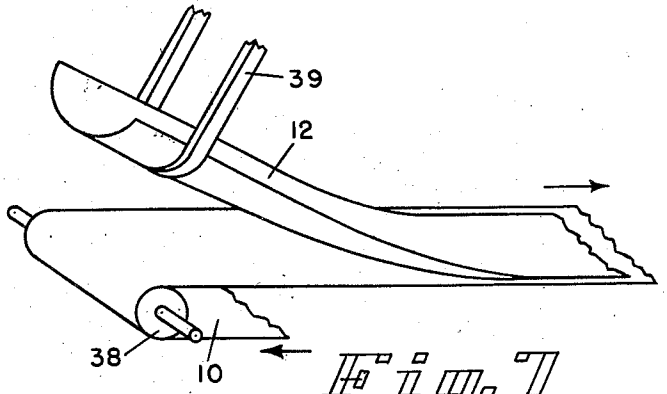


Fig. 7



INVENTOR.
RICHARD H. WHARTON
BY Tom Walker
ATTORNEY

United States Patent Office 2,790,742 Patented Apr. 30, 1957

2,790,742

METHOD OF MAKING A TRANSFER

Richard H. Wharton, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio, a corporation of Ohio

Application September 27, 1952, Serial No. 311,902

5 Claims. (Cl. 154—121)

This invention relates to transfer devices for use in manifold stationery.

The object of the invention is to simplify the construction as well as the method of manufacture and mode of use of transfer material, whereby such material may not only be economically manufactured, but will be more efficient and satisfactory in use, adaptable to a wide range of applications, and have a relatively long and useful life.

It is a further object of the invention to improve over present carbon transfer devices by providing a transfer medium of relatively longer life and capable of producing a greater number of legible impressions.

Another object of the invention is to control the amount of transfer material applied to underlying sheets with the view of making the amount of material transferred substantially uniform over the life of the transfer device.

A further object of the invention is to prevent smudging of paper in overlying relation to the transfer device, and to reduce wear on the device caused by impressions made thereon with a pencil, pen or imprinting device.

Still another object of the invention is to produce a generally new fabricated transfer device having multiple laminations of wax, absorbent paper and plastic film, all united in a unitary web.

Another object of the invention is to avoid the entrapment of air in applying the plastic film to the absorbent paper.

A further object of the invention is to provide transfer material possessing the advantageous features, the inherent meritorious characteristics and the method of manufacture herein mentioned.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation, as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the drawing, wherein is found the preferred but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a fragmentary view in cross section of the transfer device in accordance with the illustrative embodiment of the invention;

Fig. 2 is a diagrammatic view of one process for applying or impregnating the absorbent paper with ink;

Fig. 3 is a diagrammatic view of another method of impregnating hte paper with ink;

Fig. 4 is a diagrammatic view of still another method of impregnating the paper with ink;

Fig. 5 is a diagrammatic view showing a method of coating one side of the inked paper with wax;

Fig. 6 is a diagrammatic view showing a method of applying the plastic film to the inked and waxed absorbent paper; and

Fig. 7 is a detail view, partly diagrammatic, showing a method of curling the plastic film prior to its application

to the absorbent paper to secure a progressive lateral engagement of the film with the paper.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawings, a transfer device in accordance with the illustrative embodiment of the invention is shown in Fig. 1 in fragmentary form. It is of laminated construction and comprises essentially a sheet or web of absorbent, unsized paper **10**. The paper **10** is impregnated with an oil soluble ink. On the under side of the paper **10** is a wax coating **11**, the waxed side of the transfer device being the side through which impressions are transmitted. On the opposite side of the transfer device, or that side receiving the impression to be transmitted, is a layer or lamination **12** in the form of a sheet or web of cellophane, cellulose acetate or other plastic film.

The wax coating **11** is permeable but functions as a flow retarding medium with respect to the ink contained in the paper **10**. The wax coat prevents "bleeding" of the ink-impregnated paper which is the cause of smudging of underlying record sheets. At the same time, the wax coating regulates the amount of ink transmitted to such underlying record sheets so that when first used, or first subjected to writing pressure, an excess amount of ink is not transferred or permitted to flow to the underlying paper. Continued writing removes the wax coating concurrently with the depleting of ink in the impregnated paper. Thus, the protective influence of the wax is exerted in correspondence with and in proportion to the need therefor.

The plastic film **12** provides a non-permeable coating on the top side of the transfer device whereby to prevent smudging of overlying record sheets, and to reduce wear caused by writing on the ink impregnated paper **10**.

The manufacture of the transfer device may take place in a series of method steps, for example as illustrated in Figs. 2 to 7. Thus, Fig. 2 shows one method of impregnating the absorbent paper **10** with ink. According to this method step, a web of paper **10** passes over a coating roll **13** having a rotatable mounting in an ink fountain **14**, thence around an idler roll **15** and between squeeze rolls **16** and **17**, the latter of which rotates in another ink fountain **18**. Rod scrapers **19** and **21** are located immediately beyond the respective fountains **14** and **18** and remove excess ink from the paper surface.

Another method of inking the paper web **10** is shown in Fig. 3. According to this method the paper is passed over a coating roll **22** in an ink fountain **23**, the direction of rotation of the coating roll **22** being opposed to the direction of movement of the web. Pressure rolls **24** and **25** hold the web in contact with the roll **22** and a rod scraper **26** removes excess ink. According to this construction of impregnating the paper strips, the ink content of the paper is regulated by increasing or decreasing of the speed of the coating roll **22**.

Still another method of coating the paper web is shown in Fig. 4. Here, the web is passed through a bath of ink **27** around a roll **28**, following which pressure is applied to the web in squeeze rolls **29** and **31** to remove excess ink.

The paper web **10** having been impregnated with ink according to any of the above described methods, then has the wax coating **11** applied thereto, as in the method shown in Fig. 5 wherein the strip or web **10** passes over a coating roll **32** rotating in a bath **33** of molten wax. The excess wax is removed by a knife scraper **34**, such scraper being adjusted to leave a wax coating on the web **10** not exceeding a proportion of three to four pounds of wax per ream of paper.

The plastic film or web **12** is prepared in the form of a continuous web corresponding approximately to the web **10**. In applying the plastic film to the paper web

10, the separate webs 10 and 12 are unwound or caused to move in adjacent approximately parallel paths having a point of convergence. At this point the webs assume an intimate, contacting, superposed relation, in which condition the assembly so defined is passed through or around a series of rollers 35, 36 and 37. The plastic film thereby is fixed to the inked and waxed paper with sufficient firmness to allow handling and cutting of the resulting laminated structure as a unitary transfer device.

Fig. 7 illustrates a detail of the application of the plastic film web 12 to the paper web 10. Thus, the paper web 10 passes about a roll 38 and extends in a generally horizontal position beneath the plastic film web 12. The latter descends on the paper web 10 to make contact therewith, and just prior to such contact passes through a guide loop 39 which tends to raise the side edges of the web 12, in effect curling such web about its longitudinal axis. As a result, as the plastic film web 12 descends upon the paper web 10, the center of the plastic film web 12 descends upon the paper web 10, the center of the plastic film strikes the paper first and further lateral engagement of the film with the paper is a progressive action which starts at the center and extends gradually to the side edges. By applying the plastic web to the paper web in this manner no opportunity is afforded for the entrapment of air between such members. Since the plastic web 12 engages the paper web 10 progressively in an axial sense, it may broadly be considered to have a compound motion whereby a contact is effected between the plastic and paper webs which is progressive both in a lateral and an axial sense.

It will be understood that while the instant transfer device may have its principal utility in manifold stationery wherein it is made up as a part of a manifold set or assembly, such devices may be cut and formed for use as general utility carbon paper.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect.

Having thus described my invention, I claim:

1. A method of making a laminated transfer device for use in manifold stationery, including the steps of saturating an absorbent paper with ink, applying to the underside of said paper a flow metering permeable wax coating, applying to the topside of said paper an impermeable plastic film, curling said film transversely of its length and then releasing said plastic film immediately prior to contact application to the paper, and passing the device so formed through rollers to fix the film upon the paper with sufficient firmness to allow handling and cutting of the device as a unit and to provide a transfer device with a concurrent proportionate controlled depleting of the flow metering wax coating and the ink stored in said paper in use.

2. A method of applying an impermeable plastic film to a strip of paper, characterized by the step of guiding the plastic film over and to the paper raising the side edges of the plastic film to effect a laterally curved condition of the film just prior to contact of the film with the paper so that the center of the film engages the paper first following which the sides of the film are released and engage the paper in a laterally progressive movement in self induced fashion.

3. A method of making a transfer device, including the steps of preparing continuous webs of absorbent paper and impermeable plastic film, impregnating said paper web with a transfer material, unwinding said webs in adjacent converging paths so as to apply said plastic film to one side of the paper, and curling one of said webs prior to its engagement with the other web, then releasing said one web to make a self induced automatic progressive lateral contact with said other web avoiding the entrapment of air between the webs said one web automatically sealing to the other in the process.

4. A method of making a transfer device for manifold stationery, including the steps of preparing continuous webs of absorbent paper and of impermeable plastic film, impregnating said paper web with a transfer material, inducing a flow retarding medium on said impregnated paper, unwinding said webs in adjacent converging paths whereby to direct said film to one side of said paper progressively in an axial sense, and curling one of said webs prior to its engagement with the other web to make the central axial portion thereof initially engage said other web, said one web for automatic self induced recovering thereof for progressive contact with the other web in a lateral as well as axial sense.

5. A method of making a transfer device for use in manifold stationery, including the steps of preparing continuous webs of uncoated absorbent paper and of impermeable plastic film, impregnating the paper web with a transfer material, inducing a flow retarding medium on said uncoated paper, unwinding said webs in adjacent converging paths whereby to apply said plastic film to said paper as a backing, and imparting to one of said webs a transversely curved configuration and then a release thereof immediately prior to contacting application to the other web to automatically induce a compound motion to effect a self induced sealing contact between said webs which is progressive in a lateral as well as an axial sense.

References Cited in the file of this patent

UNITED STATES PATENTS

1,700,415	Neidich	Jan. 29, 1929
1,864,097	Sherman	June 21, 1932
1,968,095	Poschel	July 31, 1934
1,986,954	Abrams et al.	Jan. 8, 1935
2,040,564	Rapley	May 12, 1936
2,084,221	Schutz	June 15, 1937
2,263,196	Stolle et al.	Nov. 18, 1941
2,306,046	Duggan et al.	Dec. 22, 1942
2,325,584	Barnhart	Aug. 3, 1943
2,340,452	Child et al.	Feb. 1, 1944
2,408,147	Kneale	Sept. 24, 1946
2,501,495	Carroll et al.	Mar. 21, 1950
2,528,168	Paulsen	Oct. 31, 1950
2,598,892	Critchlow et al.	June 3, 1952

FOREIGN PATENTS

399,578	Great Britain	Oct. 12, 1933