MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS -1963
COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952-1962

CONVENTION APPLICATION FOR A PATENT

(This form may be signed by the applicant or by the Australian Patent Attorney.)

XEROX CORPORATION, a corporation organized under the laws of the State of New York, of Xerox Square, ROCHESTER, NEW YORK, United States of America,

hereby apply for the grant of a Patent for an invention entitled

IMPROVEMENTS IN AND RELATING TO PHOTOCOPYING

which is described in the accompanying complete specification. The application is a Convention application and is based on the application(s) for patent or similar protection made in Great Britain on 21st December, 1973 under No. 59,528/73


Dated this 18th day of November, 1974.

Signature of applicant(s).

(a) Signature(s) of applicant(s).

(b) Seal of Company

Note: Initial all Alterations.

To:
THE COMMISSIONER OF PATENTS
COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952-1962

DECLARATION IN SUPPORT OF CONVENTION APPLICATION FOR A PATENT
OR PATENT OF ADDITION

In support of the Convention Application for a patent
(patent or addition) for an invention entitled: IMPROVEMENTS
IN AND RELATING TO PHOTOCOPYING.

I, Richard Alvin TOMLIN
being an employee of XEROX CORPORATION, and whose present
address is c/o Rank Xerox House, 338 Euston Road, London, N.W.1,
England,
do solemnly and sincerely declare as follows:-

1. I am authorized by XEROX CORPORATION
the applicants for the patent (patent or addition) to make this
declaration on its behalf.

2. The basic application as defined by Section 141 of the Act
was made
in Great Britain on the 21st December, 1973
by XEROX CORPORATION.

3. David Athelton WALKER-ARNOTT of Oaklings, The Mount,
Aspley Guise, Bletchley, Buckinghamshire, England,
is (are) the actual inventor(s) of the invention and the facts
upon which the applicants are entitled to make the application
are as follows:- By virtue of an assignment dated the 7th
October, 1974 whereby the said inventor(s) assigned all
his (their) interest in and to the said invention to XEROX
CORPORATION.

4. The basic application referred to in paragraph 2 of this
Declaration was the first application made in a Convention
country in respect of the invention the subject of the applica-
tion.


To: The Commissioner of Patents, (Patent Counsel)
Canberra, ACT.
The following statement is a full description of this invention, including the best method of performing it known to us: -

1.

17/8/78.
This invention relates to apparatus for handling sheets or the like carrying information to be reproduced. For convenience such sheets or the like are hereinafter and in the claims referred to as originals, although it is to be understood that these may themselves be copies, and bundles of such originals are referred to as documents. More particularly, the invention is concerned with original handling apparatus for use in photocopying machines, particularly electrostatographic copying machines.

It has heretofore been proposed to feed originals to an imaging station seriatim from a stack. For example in our United States Patent Specification No. 3,630,515 there is described a recirculating original handling system in which originals are fed seriatim from a supply tray to an imaging station and returned to the supply for either recycling or removal. The system includes a feeder for feeding one original at a time from the bottom of the supply to the imaging station and back to the tray, and a bar to segregate originals returning to the tray from other originals awaiting feeding, at least until the supply of other originals is used up. Such apparatus may be programmed to precollate the copies by repetitively feeding the originals in sequence and making one copy of each original at a time. Or it may be used in conjunction with a sorter in which case multiple copies limited only by the
capacity of the sorter may be made of each original before the next one is fed, i.e. post-collation.

Documents which are to be duplicated very often consist of only a few pages (e.g. reports have frequently no more than five pages). It is an object of the present invention to provide apparatus for handling originals which is relatively unsophisticated compared with the apparatus described above yet enables precollation of the copies from a limited number of originals.

To this end the invention consists in, in or for a photocopying machine including an original illumination station, an original handling apparatus comprising an endless belt having a plurality of original receiving pockets and means for driving said belt past said original illumination station.

The photosensitive surface of a photocopying machine may be exposed to a light pattern of an image of the information on an original to be reproduced by scanning a stationary original using a moving illumination source and a moving optical system or by moving the original past a stationary illumination source and optical system. A third method is to use flash exposure where both the light source and the original are stationary during the exposure step. Apparatus of this invention may be utilized in machines employing any of these exposure methods and accordingly the belt drive means may be arranged to drive
the belt continuously or stepwise.

The invention is particularly suitable for use in photocopying machines employing so-called contact exposure in which the original is fed between a stationary illumination source and a moving photosensitive surface, the original being moved in synchronism with the surface and face down to the surface and an image of the information on the original being obtained by illumination through the sheet or the like on which it is supported. In order to protect the original it is usually contained in a transparent envelope. For such use both sides of the pockets of a belt of this invention must be transparent (which term as used herein and in the claims includes translucent). Where the image is obtained by reflecting light from the original, only one side of the pocket need be transparent.

Where the photosensitive surface and the original are to be moved synchronously during the exposure step, the photosensitive surface is generally on a drum or the like and in such case the belt is preferably driven by a drive taken from the drum or the like.

In order that the invention may be more readily understood, reference will now be made to the accompanying drawings, in which:-

Fig. 1 is a schematic side elevation of one embodiment of electrostatographic copying machine according to this invention; and
Fig. 2 is a partial perspective view of the embodiment of Fig. 1.

Referring to the drawings, the general operation of an electrostatographic machine as illustrated will first be described with reference to Fig. 1. A moving photoconductive plate, in this instance having an endless surface constituting the periphery of a drum 1, is first uniformly charged at a charging station 2 and the surface then exposed at an exposure station represented by a lamp 3 to a light pattern of the image sought to be reproduced thereby to discharge the charge in the areas where light strikes the plate surface. The undischarged areas of the surface thus form an electrostatic charge pattern in conformity with the configuration of the original image pattern. The embodiment illustrated employs contact exposure in which the original is driven past the exposure station, face down to the drum and synchronously with the latter.

The electrostatic latent image is then developed into visible form by the development system 4 which in this embodiment is a liquid development system employing the techniques described in British Patent Specification No. 880,597 and schematically represented by an applicator roll of such a system. As described in that specification the liquid developer is applied to the photoreceptor by an applicator in the form of a roll having a peripheral surface.
comprising lands and valleys such that the liquid developer is contained in the valleys out of contact with the photoreceptor, whilst the surfaces of the lands are in contact with the photoreceptor. In such an arrangement, the liquid developer is attracted from the valleys to the electrostatic latent image in image configuration. The illustrated embodiment exemplifies a typical example of such an arrangement in which the applicator is a rigid cylindrical member having on its surface a pattern of grooves and ridges which comprise the lands and valleys respectively, the liquid developer being maintained in the valleys below the surface of the lands.

As the photoreceptor surface bearing the electrostatic latent image and the applicator are brought into moving contact the liquid developer is drawn to the photoreceptor from the valleys of the applicator roll by the charges which form the electrostatic latent image.

The development system of the illustrated embodiment may be constructed for example as described in our co-pending British patent application No. 30,010/73.

Subsequent to the development operation the now visible image is transferred from the plate to a sheet of final support material 5, such as paper or the like, thereby to form a permanent print, at a transfer station schematically illustrated by a transfer roll 6. The paper is suitably supplied using known techniques from a
supply tray 7 and the copies produced collected in a bin or tray 8.

Following transfer, the drum surface is cleaned of residual developer material at cleaning station 9 suitably by means of a blade 10 arranged at a leading angle to the direction of drum rotation and collected in a sump 11 for subsequent disposal. The drum surface is finally illuminated at 12 to remove any remaining charge therefrom.

Referring to Figs. 1 and 2, the original handling apparatus of this invention comprises an endless belt 20, formed for example by seaming together the ends of a strip, having a plurality of axially spaced original pockets 21 along its length on its exterior face. The belt is of transparent plastics material and the pockets are formed by welding sheets of plastics material to the belt along three edges thereof leaving an opening for the insertion and removal of originals to be copied. Suitable plastics materials are polyvinylchloride and a polyester, e.g. Mylar. The belt extends over two pairs of sprockets 22 mounted on axles 23, 24 and the belt has sprocket holes 19 accurately punched or otherwise formed along the side edges thereof. In order to ensure that the movement of the belt 20 is synchronized with that of the drum 1, the belt is driven directly from the drum. To this end, the axle 24 carries at one end a gear 25 which meshes with a drive gear 18 on
the end of the drum 1 (Fig. 2).

The axles 23, 24 are suitably relatively adjustable for loading and unloading of the belt to permit the use of belts having differing numbers and/or sizes of pockets. Or cassette loading of different belts may be employed. Such a cassette may comprise a housing or frame supporting a belt mounted on the sprockets 22. In the case of cassette loading, the drive suitably comprises a spindle 26 onto which one of the sprocket pairs is loaded and which carries a pulley 27 driven via a belt 28 from a pulley 29 on the spindle of the drum 1 (Fig. 1).

In operation, the pages of a document to be copied are loaded into the pockets 21 either before loading of the belt into the apparatus or whilst it is in position on the sprockets 22 (in which latter event means should be provided to disengage the sprockets from the drive thereby to allow them to freewheel during loading of the originals). The copying machine is then started up and operates in the manner generally described above, each pocket being repeatedly driven past the exposure station 3. In this way, the copies will be produced serially in the correct order, i.e. precollated.

It will be appreciated that various modifications may be made to the specific details referred to herein without departing from the scope of the invention as defined in the appended claims.
CLAIMS
The claims defining the invention are as follows:

1. In or for a photocopying machine including an original illumination station, an original handling apparatus comprising an endless belt having a plurality of original receiving pockets and means for driving said belt past said original illumination station.

2. The invention as claimed in claim 1, in which the belt is of transparent plastics material.

3. The invention as claimed in claim 2, in which said pockets are formed by welding pieces of transparent plastics material to one face of the belt along three side edges.

4. The invention as claimed in claim 1, 2 or 3, in which said drive means uses sprockets engaging holes punched or otherwise formed along the edges of the belt.

5. The invention as claimed in claim 1, 2, 3 or 4, in which said belt is replaceably mounted.

6. The invention as claimed in claim 5, wherein the belt is supported in a cassette.

7. An electrostatographic copying machine as claimed in any preceding claim, in which the belt is driven from the photoreceptor.

8. Original handling apparatus constructed, arranged and adapted to operate substantially as hereinbefore described with reference to the accompanying drawings.
9. An electrostatographic copying machine constructed, arranged and adapted to operate substantially as hereinbefore described with reference to the accompanying drawings.

10. Every novel feature herein.

Dated this 18th day of November, 1974.

XEROX CORPORATION
By its Patent Attorneys,
DAVIES & COLLISON
DRAWINGS