Aug. 8, 1950 G. WEISS 2,518,208

COPYING DEVICE FOR PATTERN PIECES

Filed Dec. 31, 1948 3 Sheets-Sheet 1

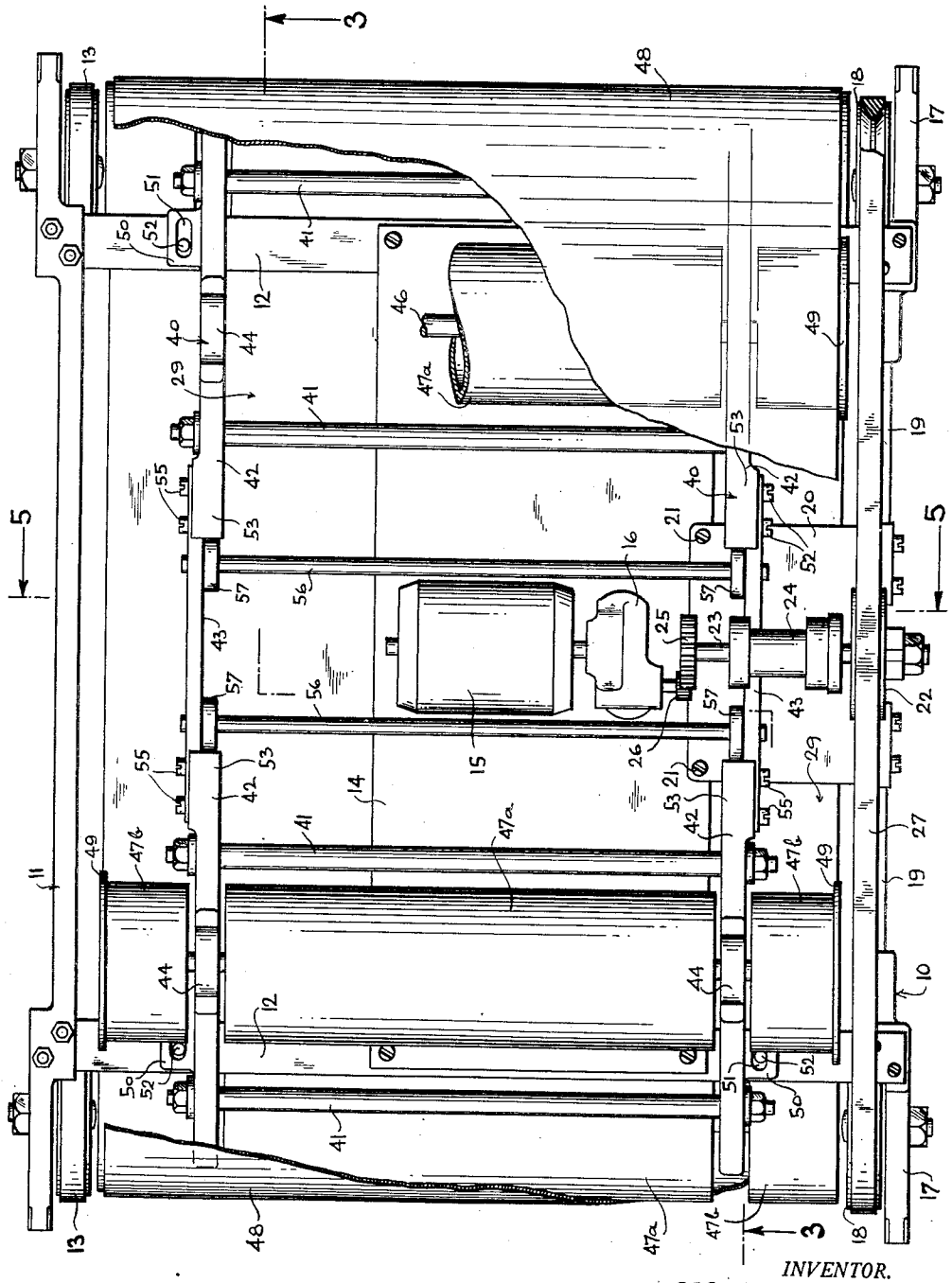


FIG. 1.

INVENTOR.
GERHART WEISS
BY Mock & Blum
ATTORNEYS.

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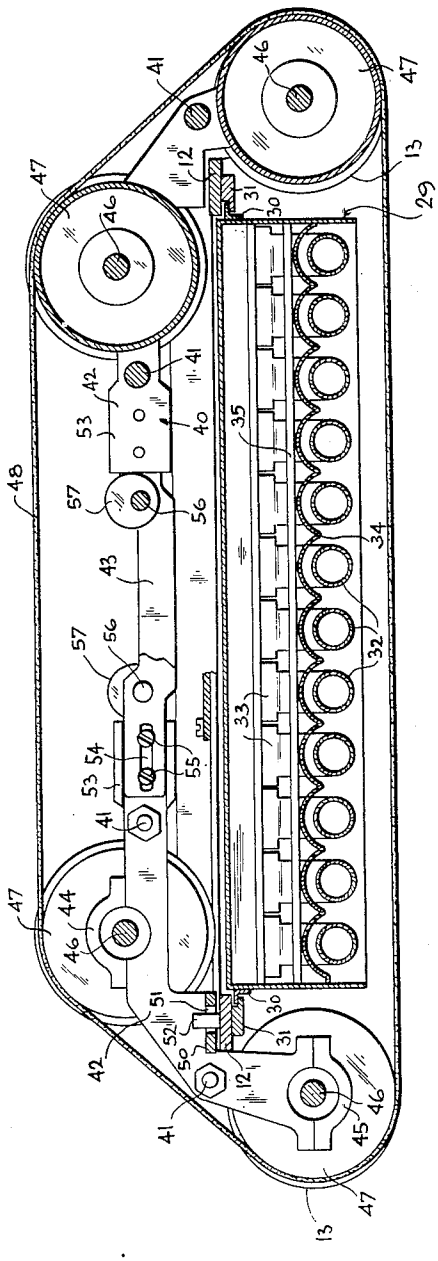


FIG. 3.

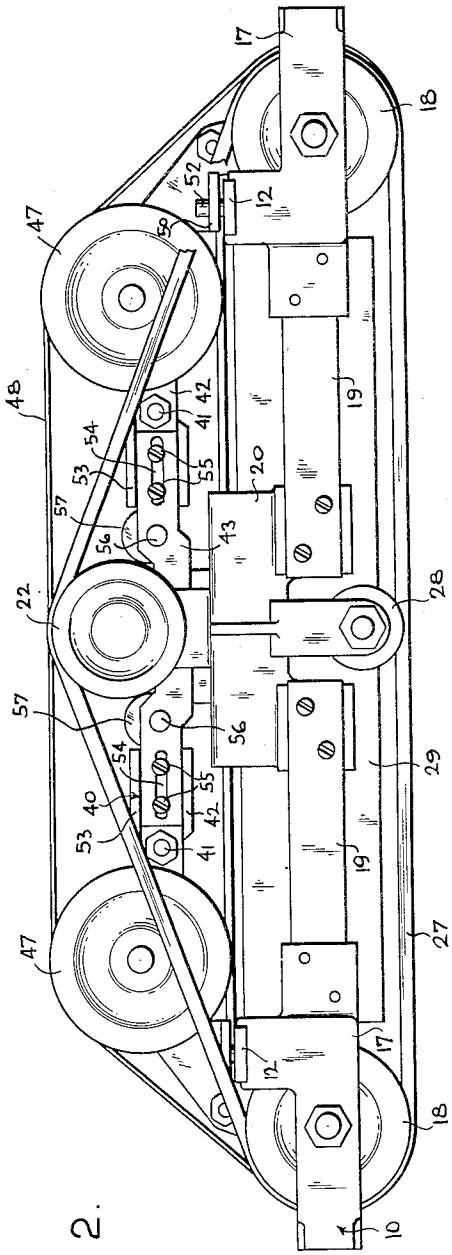


FIG. 2.

INVENTOR.
GERHART WEISS

BY Mock & Blum

ATTORNEYS.

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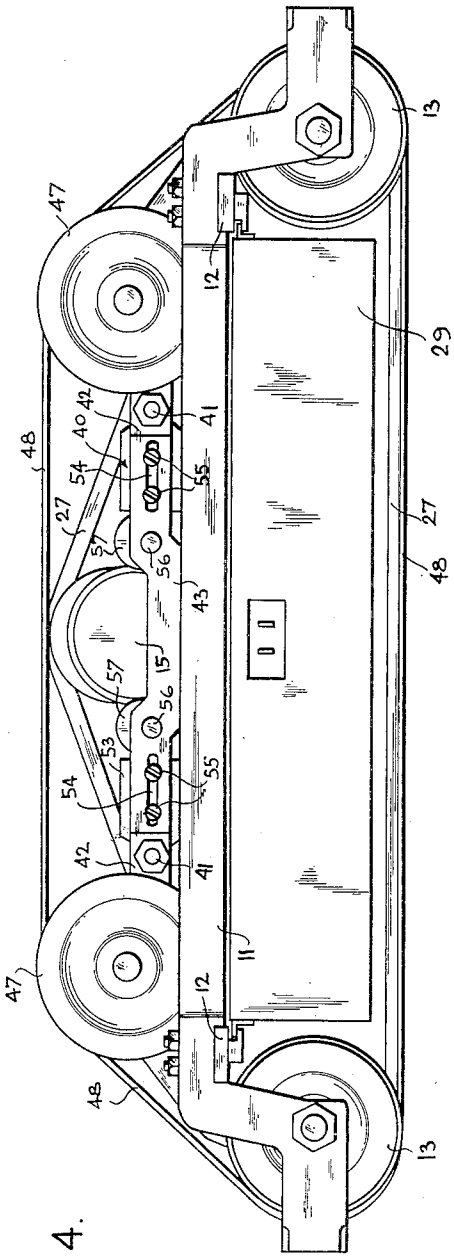


FIG. 4.

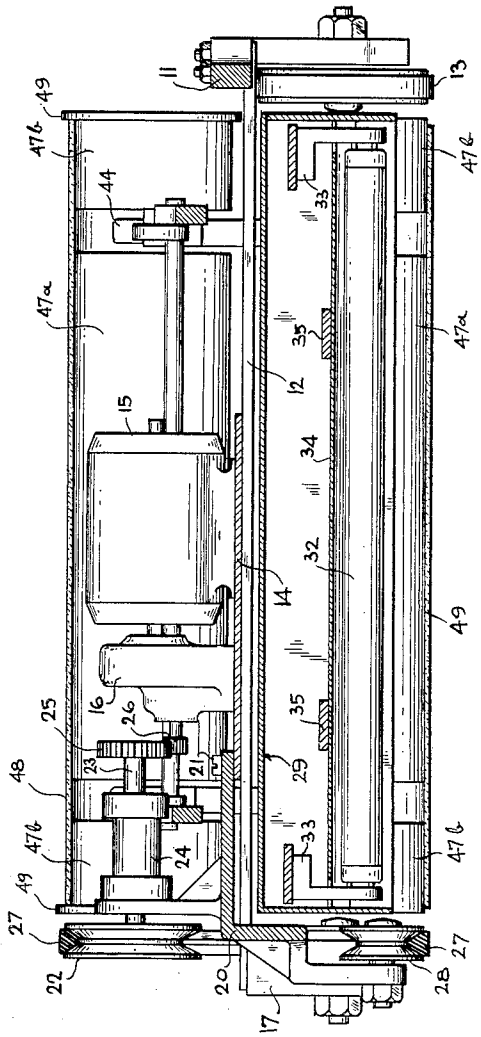


FIG. 5.

INVENTOR.
GERHART WEISS

BY Mock & Blum

ATTORNEYS

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UNITED STATES PATENT OFFICE

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COPYING DEVICE FOR PATTERN PIECES

Gerhart Weiss, Long Island City, N. Y., assignor to Multi-Tracer Corporation of America, New York, N. Y., a corporation of New York

Application December 31, 1948, Serial No. 68,680

10 Claims. (Cl. 95—73)

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This invention relates to a copying and reproducing device, and more especially, to such a device adapted for use in copying patterns for clothing and the like.

It is a general object of the invention to provide a copying device adapted for reproducing a plurality of pattern pieces laid out upon a table, the device holding the pattern pieces in position as it passes thereover and being constructed and arranged in such a manner as to travel in an undeviating path without requiring the use of special guiding elements, such as tracks or channels.

Another object of the invention is the provision of a copying device of the character indicated having a main driving frame or chassis upon which is mounted a secondary frame including an endless transparent belt mounted on a roller system, the secondary frame having vertical freedom relative to the main driving frame in order to allow the device to accommodate itself to irregularities in the surface over which it travels without causing diversion from its predetermined path.

A further object of the invention is the provision of a copying device of the character indicated having a simple arrangement for adjustably tensioning the transparent belt of the secondary frame, the tensioning arrangement allowing uniform tensioning on both sides of the belt in order to preclude twisting or dragging action during the operation of the device.

The pattern pieces to be copied by the device are first placed loosely over a sheet of blueprint paper or other photosensitive material. The copying device travels over the pattern pieces which are held in position by the endless transparent belt as it moves upon its supporting rollers. An illuminating unit carried by the device, preferably on the main driving frame, directs light downwardly through the transparent belt, thereby reproducing the individual pattern pieces in outline on the photosensitive sheet. The device is driven by means of a pair of driver pulleys carried by the main frame of the machine on one side thereof and connected to a motor, also mounted on the main frame of the machine, by means of a V-belt. The bottom surface of the V-belt between the driver pulleys bears against the supporting surface or table upon which the device travels, thereby maintaining an undeviating path of travel for the device. The side of the main frame opposite the driver pulleys and V-belt is provided with a pair of freely rotatable wheels.

The features of the invention will be readily understood in the course of the following de-

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tailed description taken in connection with the accompanying drawings, which illustrate a preferred embodiment of the invention, and wherein:

Fig. 1 is a top plan view of the copying device, parts being broken away to illustrate the relationship of the main frame, the secondary frame and roller system and other elements;

Fig. 2 is a front elevational view showing the driver pulleys and V-belt on the main frame of the machine;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1 showing the roller system and endless transparent belt of the secondary frame, the transverse supports of the main frame, and the illumination compartment carried by the main frame;

Fig. 4 is a rear elevational view showing the freely rotatable wheels on the main frame on the side opposite the driver pulleys and V-belt of Fig. 2; and

Fig. 5 is a transverse sectional view taken on line 5—5 of Fig. 1.

Referring now to the drawings in greater detail, the main driving frame or chassis of the device comprises a longitudinal front member 10 and a longitudinal rear member 11 interconnected by means of a pair of transverse supports 12. Rear longitudinal member 11 is shaped suitably to carry at each end thereof a freely rotatable wheel 13, as best shown in Figs. 1, 4 and 5. A mounting plate 14 extends between transverse supports 12 for imparting rigidity to the driving chassis and for supporting a motor 15 and a suitable gear reduction housing 16 in order to assure the desired rate of travel for the driving chassis, as will appear more fully hereinafter.

Longitudinal front member 10 preferably comprises a pair of outer bearing supports 17 carrying the pulleys 18 and inwardly extending connecting arms 19 fixed to a central frame member or L-shaped bracket 20, the upper branch of which may be secured to mounting plate 14 by means of screws 21. Bracket 20 also carries a driving pulley 22 and pulley shaft 23 on a bearing support 24. Driving connection is assured between gear reduction housing 16 and pulley shaft 23 by means of a gear 25 and pinion 26. Pulleys 18 are connected to main driving pulley 22 by means of a V-belt 27. The lower branch of bracket 20 also carries an idler pulley 28 engaging V-belt 27 intermediate the outer pulleys 18. By reason of the arrangement described the portion of V-belt 27 between the driver pulleys 18 bears against the supporting surface or table (not shown) upon which the device travels, thereby maintaining an undeviating path of

travel for the device in a predetermined direction as it passes over the pattern pieces to be copied.

An illuminating compartment or box 29 is removably supported by the main driving chassis as by means of angle-bars 30 slidable within channels defined by holder bars 31 secured to the underside of transverse supports 12. Compartment 29 carries a plurality of lighting elements 32 which may take the form of fluorescent tubes retained between sockets 33. Reflectors 34 may be provided for lighting elements 32 and may be secured in any suitable manner, as by means of longitudinal holder elements 35 (see Figs. 3 and 5). The removable mounting of illuminating compartment 29 facilitates the replacement of lighting elements when required simply by sliding the compartment outwardly at the rear of the device as illustrated in Fig. 4.

A secondary frame carrying an endless transparent belt retained on a roller system is mounted on the main driving frame or chassis just described. The secondary frame includes a pair of longitudinal frame members 40 interconnected by spacer elements 41. Each of said longitudinal frame members preferably comprises a pair of end brackets 42 and an intermediate connecting arm 43. End brackets 42 are formed with upper and lower bearing portions 44 and 45 retaining shafts 46 which carry the upper and lower rollers 47. Each of the rollers 47 comprises an intermediate portion 47*a* extending between end brackets 42 and a pair of end portions 47*b*. A transparent endless belt 48 of synthetic plastic or any other suitable material is mounted on rollers 47, the pair of upper end portions 47*b* preferably having outer flanges 49 retaining the belt in position on the rollers. Flanges are not provided on the end portions 47*b* of the pair of lower rollers since the lower portion of endless belt 48 between said lower rollers is required to contact and hold in position the pattern pieces (not shown) to be reproduced by the device during its passage thereover.

An important feature of the invention resides in mounting the secondary frame, including the rollers 47 and endless transparent belt 48, in such a manner that said frame and belt will have some degree of vertical freedom with respect to the main driving chassis. This arrangement allows the belt to find its own rate of travel independent of the rate of travel of the main driving chassis and as a result of the frictional contact between the belt and the surface over which it travels, thereby precluding shifting or displacement of the pattern pieces as would occur if the belt were positively driven as the device travelled thereover. Further, the arrangement allows the secondary frame and belt to accommodate themselves to slight irregularities in the surface over which they travel without causing diversion of the main driving chassis from its predetermined path.

In the preferred embodiment of the invention, vertical movement of the secondary frame is enabled in the following manner: Longitudinal members 40 of the secondary frame rest upon the transverse supports 12 of the main driving chassis. Each end bracket 42 is provided with a lateral lug or ear 50 having an elongated slot 51 for the reception of a projection or pin 52 fixed to transverse support 12. Thus the main driving chassis will carry along the secondary frame while permitting vertical movement of said secondary frame including the roller system and transparent belt 48.

Provision is also made for uniformly tensioning transparent belt 48 on both sides thereof in order to preclude twisting or dragging action during the operations of the device. For this purpose the inner ends of roller brackets 42 are preferably channel-shaped as shown at 53 for slidably retaining the outer ends of connecting arm 43, which is formed with slots 54 for the reception of set screws 55. Shafts 56 extend between connecting arms 43 and carry at each end an eccentric 57 arranged to bear against a respective roller bracket 42. If it becomes necessary to tighten transparent belt 48 the set screws 54 of both roller brackets 42 on one side of the device are loosened and tension-adjustment shaft 56 is rotated so that eccentrics 57 at each end thereof will move the roller brackets and the attached upper and lower roller pair 47 outwardly an equal distance in unison, thereby tensioning the belt 48 uniformly on both sides. Set screws 54 are of course tightened after the desired tension of the belt is attained in order to retain the roller brackets and rollers in adjusted position.

In actual operation of the copying device a sheet of blueprint paper or other photosensitive material is first placed on the table top and a plurality of pattern pieces to be reproduced are superimposed upon the photosensitive sheet. The copying device is positioned to travel over the pattern pieces in a predetermined path and the device is maintained in its undeviating path by the engagement of the driving belt 27 against the table surface while the pattern pieces are flattened and held in position by the transparent endless belt which moves on the rollers 47 as a result of frictional engagement against the pattern pieces and photosensitive sheet. During the travel of the device light from the lighting elements 32 in illuminating compartment 29 is directed upon the pattern pieces through the transparent belt 48, thereby reproducing the individual pattern pieces in outline on the photosensitive sheet.

Since certain modifications may be made in the copying device of the present invention without departing from the scope thereof, it is intended that all matter contained in the foregoing specification and shown in the accompanying drawings be interpreted merely as illustrative and not in a limiting sense.

What is claimed is:

1. A copying device for pattern pieces and the like comprising a main driving frame having a pair of freely rotatable wheels on one side thereof and a pair of driven pulleys on the other side thereof, a driving pulley and a driving belt interconnecting said driving pulley and said driven pulleys, the lower portion of said driving belt between said driven pulleys being arranged to bear against the surface along which the device travels whereby to maintain an undeviating path of travel for the device, a secondary frame carried by said main driving frame, said secondary frame including a plurality of rollers and a transparent endless belt retained on said rollers, said rollers and endless belt being disposed to maintain at least a portion of said endless belt substantially in the plane defined by the lower portion of said driving belt and the lower portions of said freely rotatable wheels, and an illuminating compartment having a plurality of lighting elements arranged to direct light downwardly through said transparent belt upon the pattern pieces to be copied.

2. A copying device for pattern pieces and the like comprising a main driving frame having a

pair of freely rotatable wheels on one side thereof and a pair of driven pulleys on the other side thereof, a driving pulley and a driving belt interconnecting said driving pulley and said driven pulleys, the lower portion of said driving belt between said driven pulleys being arranged to bear against the surface along which the device travels whereby to maintain an undeviating path for the device, a removable illuminating compartment carried by said main driving frame and having a plurality of lighting elements for directing light downwardly upon the pattern pieces being copied and a secondary frame mounted on said driving frame for vertical movement, said secondary frame including a plurality of rollers and a transparent endless belt retained on said rollers in a position such that at least a portion of said endless belt is substantially coplanar with the lower portion of said driving belt, whereby to allow said transparent belt to travel over said pattern pieces at a rate independent of the rate of travel of said main driving frame.

3. A copying device for pattern pieces and the like comprising a main driving frame having a pair of freely rotatable wheels on one side thereof and a pair of driven pulleys on the other side thereof, a driving pulley and a driving belt interconnecting said driving pulley and said driven pulleys, the lower portion of said driving belt between said driven pulleys being arranged to bear against the surface along which the device travels whereby to maintain an undeviating path for the device, a removable illuminating compartment carried by said main driving frame and having a plurality of lighting elements for directing light downwardly upon the pattern pieces being copied and a secondary frame mounted on said driving frame for vertical movement, said secondary frame including a plurality of rollers and a transparent endless belt retained on said rollers in such a position that at least a portion of said endless belt will be disposed to bear against the surface along which the device travels, whereby to allow said transparent belt to travel over said pattern pieces at a rate independent of the rate of travel of said main driving frame, and adjustable tensioning means carried by said secondary frame for uniformly tightening said transparent belt on both sides thereof.

4. A copying device in accordance with claim 3, wherein said main driving frame is provided with a plurality of pins and said secondary frame is provided with corresponding slotted lugs for the reception of said pins, whereby to allow vertical movement of said secondary frame with respect to said driving frame.

5. A copying device for pattern pieces and the like comprising a main driving frame, having a pair of freely rotatable wheels on one side thereof, and a pair of driven pulleys on the other side thereof, a driving pulley and a driving belt interconnecting said driving pulley and said driven pulleys, the lower portion of said driving belt between said driven pulleys being arranged to bear against the surface along which the device travels whereby to maintain an undeviating path for the device, a removable illuminating compartment carried by said main driving frame and having a plurality of lighting elements for directing light downwardly upon the pattern pieces being copied and a secondary frame mounted on said driving frame for vertical movement with respect thereto, said secondary frame comprising a pair of longitudinal frame members rigidly spaced apart, each of said frame members comprising a central connecting arm and a pair of outer brackets slidable thereon, an upper and lower roller supported by each pair of said outer brackets of said frame members, a transparent endless belt retained by said rollers and so arranged that a portion of said endless belt will bear against the surface along which the device travels, and adjustable tensioning means supported by said connecting arms and simultaneously operable against a pair of said slidable brackets for uniformly tightening said transparent belt on both sides thereof.

6. A copying device in accordance with claim 5, wherein said main driving frame is provided with a plurality of pins and each of the outer brackets of said secondary frame is provided with a slotted lug for the reception of a respective pin, whereby to allow slidable endwise movement of said outer brackets and vertical movement of said secondary frame with respect to said driving frame.

7. A copying device in accordance with claim 5, wherein said tensioning means includes eccentric members arranged to bear against the inner ends of a pair of said slidable brackets in unison.

8. A copying device for pattern pieces and the like comprising a main driving frame having a pair of freely rotatable wheels on one side thereof and a pair of driven pulleys on the other side thereof, a driving pulley and a driving belt interconnecting said driving pulley and said driven pulleys, the lower portion of said driving belt between said driven pulleys being arranged to bear against the surface along which the device travels whereby to maintain an undeviating path of travel for the device, a removable illuminating compartment carried by said main driving frame and having a plurality of lighting elements for directing light downwardly upon the pattern pieces being copied and a secondary frame mounted on said driving frame for vertical movement with respect thereto, said secondary frame comprising a pair of spaced longitudinal frame members, each of said frame members comprising a central connecting arm having slotted ends and a pair of outer brackets slidable thereon, the inner ends of said brackets being channel shaped to receive the slotted ends of said connecting arm, an upper and lower roller supported by each pair of said outer brackets of said frame members, a transparent endless belt retained by said rollers in such a position that at least a portion thereof will bear upon the surface over which the device travels, and a rotatable shaft supported between said connecting arms, said shaft carrying eccentric members at each end arranged to bear against the inner ends of a pair of said slidable brackets in unison, whereby to uniformly tighten said transparent belt on both sides thereof.

9. A copying device in accordance with claim 8, wherein said main driving frame is provided with a plurality of pins and each of the outer brackets of said secondary frame is provided with a slotted lug for the reception of a respective pin, whereby to allow slidable endwise movement of said outer brackets and vertical movement of said secondary frame with respect to said driving frame.

10. A copying device for pattern pieces and the like comprising a framework, wheels disposed along opposite sides of said framework to support the same for movement along a surface, means on said framework for carrying a belt and so disposed that at least a portion of said belt is maintained in frictional driving contact engagement

with a surface travelled by said device, so that movement of said device over said surface produces movement of said belt in the opposite direction to ensure intimate contact between said surface and pattern pieces pressed thereupon by said belt, said belt comprising an endless loop of relatively wide, transparent flexible material carried by said means for movement independent of the movement of said wheels, and illuminating means carried by said framework for illuminating the surface being travelled through said portion of said belt.

GERHART WEISS.

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