Oct. 28, 1969 P. PEKERA ET AL 3,474,912

COPY PAPER RECEIVING AND STACKING TRAY

Filed Nov. 29, 1967 2 Sheets-Sheet 1

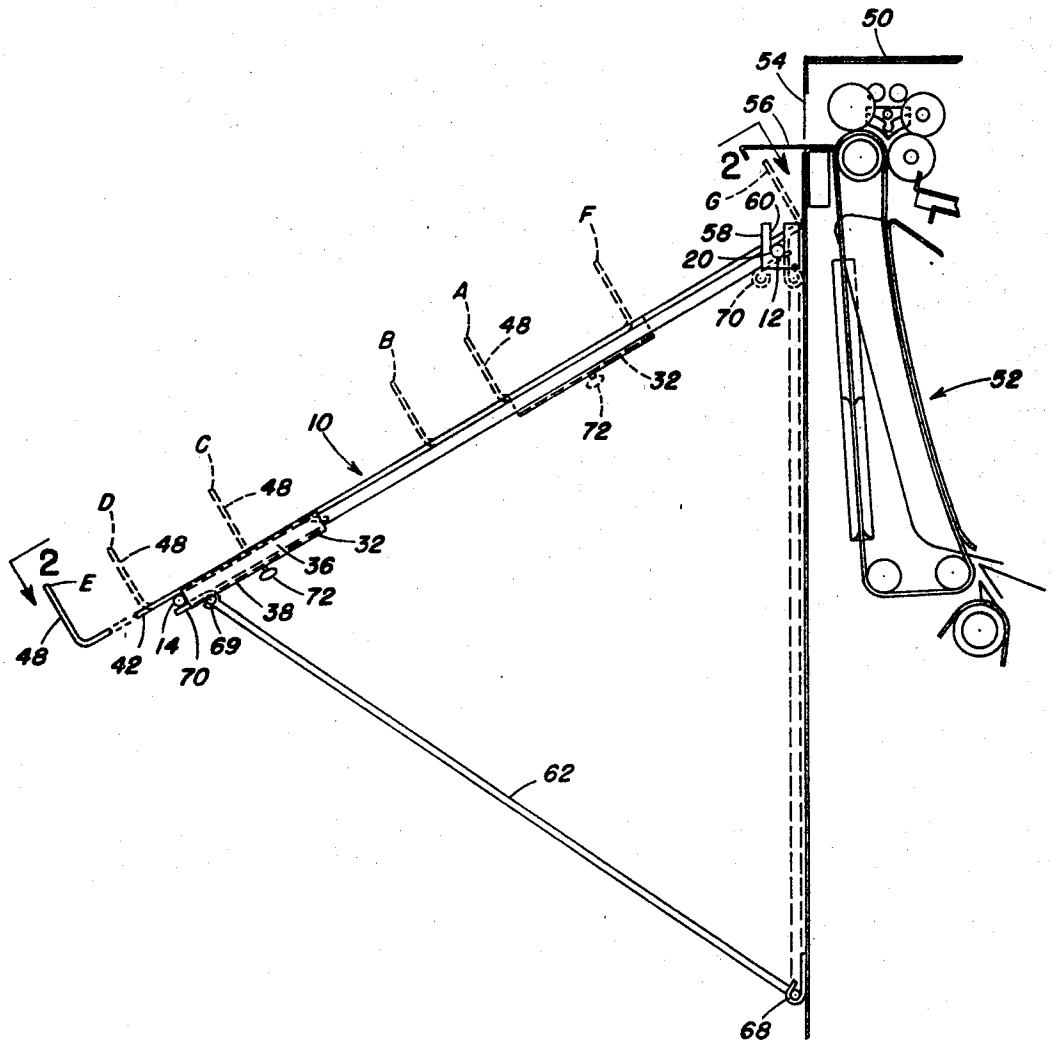


Fig. 1.

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Fig. 3.

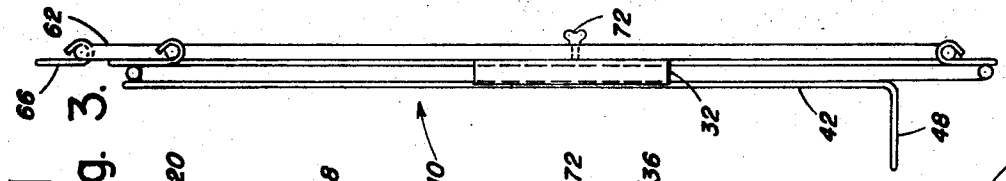
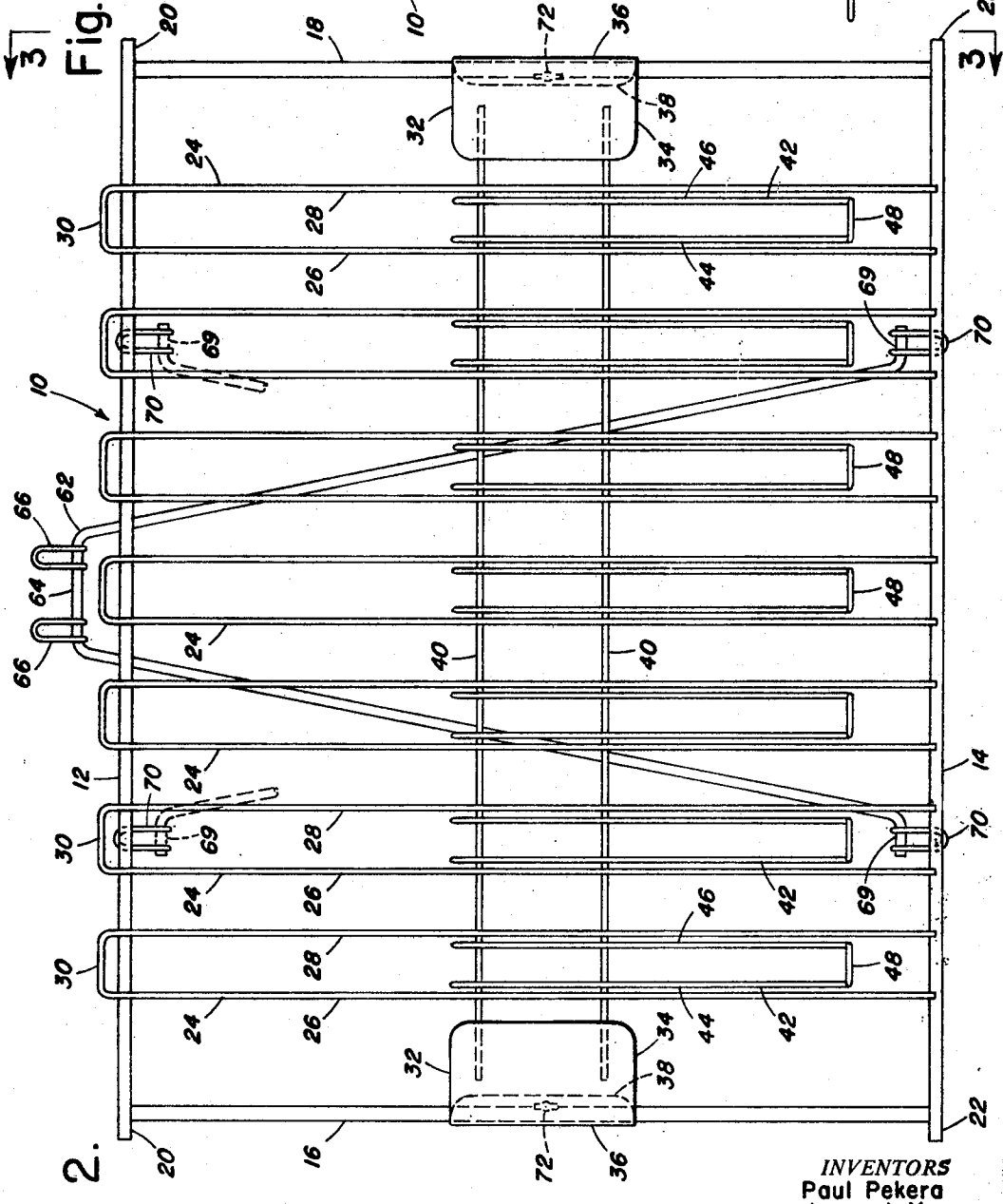


Fig. 2.



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COPY PAPER RECEIVING AND STACKING TRAY

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ABSTRACT OF THE DISCLOSURE

This invention relates to a tray for receiving and stacking varied sizes of copy papers processed by a photocopy developing apparatus. The tray is formed of wire rods and includes an adjustable paper retaining wall adapted to receive and stack copy papers from the apparatus. The tray may be reversed relative to the apparatus so as to increase the range of adjustment of the paper retaining wall for the accommodation of the copy papers. Adjustment of the retaining wall will also adapt the tray to be utilized as a conveying chute.

This invention relates generally to improvements in receiving trays for sheets of copy paper emerging from a photocopy processing apparatus and, more particularly, to a reversible receiving and stacking tray adapted to receive and stack copy papers of widely divergent physical dimensions emerging from the processing apparatus.

In photocopy processing or reproduction machines, as presently employed in industry, the copy paper upon which an imaged original is superimposed, is conveyed through the machine by suitable rollers and belts for the imaging and developing sequences. Subsequently, the developed copy paper is moved toward a discharge or delivery end of the processing apparatus and conveyed onto a suitable receiving tray or receptacle. At this time, an operator may remove the developed copy paper from the receiving tray, or if the photocopy processing machine is engaged in the high-speed development of multiple copies of an imaged original, the copy papers may be superimposed and stacked in the receiving tray for subsequent collective removal.

Although the utilization of presently known copy paper receiving trays in connection with photocopy processing machines or apparatuses are deemed to be generally satisfactory, they are subject to certain drawbacks and shortcomings when multiple copies of imaged originals of widely varying physical dimensions are processed. Frequently, imaged originals, and the resultant copy papers, may vary in length, in the direction of their conveyance through the processing apparatus, from a few inches to over two or three feet. Thus, for example, upon occasion it may become necessary to produce photocopies of rather small computer punch cards, whereas at other times multiple copies of lengthy blueprints or data sheets must be produced. In effect, the great variations in copy paper sizes developed in a particular photocopy processing apparatus has necessitated the designing of a receiving and stacking tray which may be adjusted to receive and stack as required, a plurality of developed copy papers extending over a wide range of dimensional characteristics. Presently known receiving trays have not been able to afford the adjustability and adaptability required to receive and stack widely divergent dimensionally proportioned copy papers.

The adjustable copy paper receiving and stacking tray, according to the present invention, obviates the drawbacks and disadvantages encountered in prior art receiving trays, by providing a tray which may be adjusted and reversibly mounted on a photocopy developing and processing apparatus so as to accommodate a wide range of physically varying copy papers. To this effect, the novel receiving and stacking tray contemplates the utilization of a basic copy paper tray support or bottom surface, and an upstanding wall portion against which the paper emerging from the photocopy processing apparatus impinges so as to be stacked on the bottom support surface with the upstanding wall portion being adjustably movable along the bottom surface in order to accommodate varying copy paper sizes. Further, the tray may be reversibly mounted on the processing apparatus to afford a greater latitude to the positioning of the upstanding wall portion on the bottom support surface relative to the paper discharge or delivery end of the apparatus.

Essentiallly, the adjustable copy paper receiving and stacking tray, according to the present invention, includes a flat bottom tray surface constituted of a plurality of spaced wire and rod members forming a rectangle, one edge of which is detachably mounted to the copy paper delivery end of a photocopy processing apparatus. A pair of interconnected brackets are slidably mounted on the side rod member of the bottom tray surface. Wire members projecting parallel to the path of conveyance of the copy paper and parallel to the bottom tray surface are fastened to the interconnected brackets, and extend into upwardly projecting loops which are adapted to form the paper retaining wall of the receiving and stacking tray. The tray may be detached from the photocopy developing apparatus by a simple manipulation and rotated in the plane of the bottom surface 180°, so that the edge opposite and parallel to the mounted edge may be attached to the processing apparatus. This will permit the adjustable retaining wall to be moved over a wider range or rather closer adjustable distance relative to the copy paper delivery end of the processing apparatus. Consequently, the receiving and stacking range of the tray may be extended from the copy paper sizes of punch card dimension (less than 3½ inches in width) to sheet sizes of over two feet in length. Another feature of the present inventive tray construction lies in that in the reversed position, the retaining wall may be moved into close proximity with the paper delivery end of the processing apparatus, whereby copy paper emerging from the apparatus will be conveyed over the retaining wall. This, in effect, will convert the tray into a chute and allow the paper to be guided toward another receiving surface or table.

Accordingly, it is a primary object of the present invention to provide for an adjustable copy paper receiving and stacking tray.

Another object of the present invention is to provide for an adjustable tray reversibly mounted on a photocopy processing apparatus, and with the tray adapted to receive and stack a wide range of dimensionally varied copy papers.

A further object of the present invention is to provide for a receiving and stacking tray constituted of simply constructed interconnected wire members, and with the tray being adjustable and reversibly mounted on a photocopy processing apparatus so as to accommodate a widely divergent range of copy paper sizes.

These and other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which:

FIG. 1 is a side elevational view of a receiving and stacking tray according to the present invention attached to a photocopy processing apparatus;

FIG. 2 is a plan view taken along line 2—2 in FIG. 1; and

FIG. 3 is a side view taken along line 3—3 in FIG. 2 illustrating the tray in an unattached position.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, a copy paper receiving and stacking

tray is generally designated as **10**. The tray **10**, as shown in FIGS. 2 and 3, is essentially constituted of a pair of parallel spaced heavy wire rod members **12** and **14** having a generally circular cross-sectional configuration. A similar pair of wire rod members **16** and **18** extend between rod members **12** and **14** adjacent to the ends thereof, and are rigidly fastened thereto so as to form a rectangle. Each of the wire rod members **12** and **14** have their end portions **20** and **22** extending a short distance beyond the contact points by rod members **16** and **18**.

A plurality of elongate wire rod members **24** extend between and are fastened to rod members **12** and **14** in parallel relationship between rod members **16** and **18**. Wire rod members **24** are of somewhat smaller cross-sectional diameter than rod members **12, 14, 16** and **18**, and each consists of a pair of parallel wires **26, 28** connected at one end, or extending into, a loop portion **30**. The free ends of wires **26, 28** are fastened to wire rod member **14**, whereas the loop portion **30** extends somewhat past rod member **12**. The assembly of rod members **12, 14, 16, 18** and **24** forms in general the copy paper supporting surface of tray **10**.

A sheet metal bracket **32** having a flat upper plate surface **34**, a depending side wall **36** and lower wall portion **38**, forming essentially a J shape is slidably mounted on rod member **16**, with the J shaped portion thereof encompassing the rod member. A similar sheet metal bracket **32** is slidably mounted in a like manner on rod member **18**, so that the upper plate surfaces **34** of both brackets **32** extend toward each other. A pair of spaced connecting rods **40** extend between brackets **32** below wire rods **24** and are fastened to the lower surfaces of the plate surfaces **34** so that both brackets **32** and connecting rods **40** form an integral unit.

Extending from and fastened to connecting rods **40** are a plurality of spaced wire members **42**, each of which is positioned between and extends parallel with each pair of wires **26** and **28**. Each of the wire members **42** consists of a pair of parallel spaced wires **44** and **46** attached adjacent to one end to connecting rods **40**, and extending at their distal ends, toward rod member **14**, into an upwardly projecting generally inverted U-shaped loop portion **48**. The plurality of loop portions **48** formed by the wire members is in line and in essence, constitutes an upright retaining wall adapted to retain and stack copy papers emerging from the delivery end of the photocopy processing apparatus.

In use, the tray **10** is detachably mounted on a photocopy processing apparatus **50**. The processing apparatus **50** includes a sealing sleeve and developing assembly, generally designated as **52**, the construction and operation of which is well known in the art. The sealing sleeve assembly conveys developed sheets or segments of copy paper toward a delivery end or slot **54** in the apparatus, and over a guide plate **56** adapted to guide the copy papers toward the exterior of processing apparatus **50**.

Positioned below and at the opposite ends of delivery slot **54** are a pair of mounting brackets **58**, attached to the frame of the processing apparatus **50**. The mounting brackets **58** each include an upwardly extending slot **60** adapted to receive the end portions **20** of rod member **12** so as to mount the tray **10** on the processing apparatus. In order to maintain the tray **10** in a properly downwardly inclined position below guide plate **56**, a generally V-shaped support rod **62** is provided. The apex **64** of support rod **62** includes a pair of hook-like projections **66** adapted to be attached to a bracket or mounting **68** on the frame of the processing apparatus **50**. The free or leg portions of the support rod **62** extend into outwardly bent finger portions **69** which engage a pair of spaced loops **70** fastened to the lower surface wire rod member **14**. An identical pair of loops **70** is provided on wire rod member **12**.

When the tray **10** is mounted on processing apparatus **50** as described above, the loop portions **48** which form the copy paper retaining wall may be adjusted in distance relative to the delivery slot **54** by sliding adjustment of brackets **32** along rod members **16** and **18**. When the brackets **32** are positioned adjacent to rod member **12**, in effect, closest to the processing apparatus, the length of wire members **44, 46** may be such that the loops **48** are approximately 8½ inches from the guide plate **56**, as shown in position A in FIG. 1, and thereby the tray **10** is adapted to receive and stack copy papers of that width. In order to prevent inadvertent movement of the brackets **32** on rod members **16** and **18**, wing-nut locking screws **72** are provided, and extend through threaded apertures in lower wall portions **38** of brackets **32** into clamping engagement with the rods **16** and **18**.

At times, when wider copy papers are to be processed by apparatus **50** and stacked on tray **10**, the locking screws **72** may be loosened, and brackets **32** slid along rod members **16, 18** toward wire rod member **14**, as illustrated in exemplary positions B, C, D and E in FIG. 1 of the drawings. Maximum stacking width for the tray **10** is attained when brackets **32** are positioned adjacent to rod member **14**, so that the loops **48** are in the maximum extended position E relative to delivery slot **54** of processing apparatus **50**.

Upon occasion, it may be desirable to stack copy papers onto tray **10** which are considerably narrower than 8½ inches, for example, of punch card width or even smaller. In this instance, the finger portions **69** of support rod **62** may be manually compressed or flexed toward each other so as to disengage from loops **70** on rod member **14**. This will permit the tray **10** to be moved whereby the end portions **20** of rod member **12** will lift out of slots **60** in mounting brackets **58**. The tray **10** may now be manually rotated in its own surface plane through an angular displacement of about 180° so that the rod member **14** is adjacent to the processing apparatus **50**. The end portions **22** of rod member **14** are now placed into slots **60**, and the tray is tilted so that the finger portions **69** of support rod **62** may be inserted into the loops **70** on rod member **12**. This will now mount the tray **10** in a reversed position on processing apparatus **50**. As may be ascertained from the construction of loops **48** and brackets **32**, as exemplified in loop positions F and G in FIG. 1 of the drawings, the loops **48** may be moved closer to the delivery slot **54** in order to accommodate narrower copy papers. This, of course, will greatly increase the dimensional range of copy papers adapted to be stacked on the tray **10**, thereby enhancing the versatility of the latter.

An additional important feature of the reversibly mounted tray **10** is that the loops **48** may be positioned in proximity to the apparatus **50** below guide plate **56**, as shown in position G. In effect, the tray **10** now becomes essentially a chute adapted to convey or guide copy papers of practically all physical dimensions toward a receiving surface or table.

From the foregoing, it becomes readily obvious that the receiving and stacking tray **10**, according to the present invention, may be readily and in a simple manner reversibly mounted onto a photocopy processing apparatus, and adjusted to accommodate and stack copy papers of varied sizes.

In connection with the tray construction, the wire rod members may be of standard metallic wire stock, fastened together through suitable brazing or welding methods, and surface plated or finished as well known in the art.

It should also be understood that the foregoing relates to only a preferred embodiment of the invention, and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A receiving and stacking tray adapted to receive

copy paper from the delivery end of a photocopy processing apparatus, said tray comprising;

generally planar bottom means having a first and a second edge portion, one of said edge portions being selectively attached to said apparatus adjacent said delivery end,

projecting means extending upwardly from said bottom means, said projecting means forming retaining wall means generally parallel to said delivery end for receiving copy paper therefrom and stacking the latter on said bottom means, and

means mounting said projecting means for slidable adjustment along said bottom means between a first position and a plurality of further positions so as to selectively vary the distance between said projecting means and said apparatus delivery end,

said tray being adapted to be reversibly attached to said apparatus by the other of said end portions whereby said mounting means is adapted to further selectively vary the distance between said projecting means and said apparatus delivery end.

2. A tray as defined in claim **1** wherein said mounting means is adjustable between said first position and said further positions so as to selectively move said projecting means from a maximum distance to a predetermined minimum distance from said apparatus delivery end.

3. A tray as defined in claim **1** whereby said mounting means is adjustable so as to selectively move said projecting means between an intermediate distance along said bottom means to zero distance from said apparatus delivery end when one of said edge portions are attached to said apparatus.

4. An apparatus as defined in claim **3** wherein positioning of said projecting means adjacent to said apparatus delivery end adapts said tray for use as a generally planar conveying surface.

5. A tray as defined in claim **1** wherein said first edge portion comprises a first elongate rod member,

said second edge portion comprising a second elongate rod member in parallel spaced relationship with said first rod member,

a pair of parallel spaced rod members rigidly interconnecting the end portions of said first and second rod members,

a plurality of spaced parallel wire members extending between and fastened to said first and second rod members whereby said bottom means forms a copy paper support surface.

6. A tray as defined in claim **5** wherein said mounting means comprises a pair of spaced brackets,

each of said brackets being mounted respectively on one of said interconnecting rod members for slidable movement between said first and second rod members,

means rigidly interconnecting said brackets, and said projecting means being fastened to said bracket interconnecting means.

7. A tray as defined in claim **6** wherein said projecting means comprises a plurality of parallel spaced wire members extending generally parallel to said first mentioned wire members,

and adjacent pairs of said wire members being bent upwardly and connected in substantially inverted U-shaped loop configurations so as to form said retaining wall means.

8. An apparatus as defined in claim **6** wherein each of said brackets includes fastener means adapted to lock said brackets onto said interconnecting rod members in predetermined spaced relationship with said apparatus delivery end.

9. An apparatus as defined in claim **8** wherein said fastener means comprises wing nut locking assembly.

10. An apparatus as defined in claim **4** wherein said first and second rod members include a plurality of spaced depending hook portions,

said hook portions each including an eye adapted to receive the ends of a detachable support member adapted to maintain said tray in an inclined position adjacent to said apparatus delivery end.

References Cited

UNITED STATES PATENTS

2,466,149	4/1949	Burg	211—50
2,643,002	6/1953	Rubenstein	211—50
3,294,251	12/1966	Howell	211—50

JAMES A. LEPPINK, Primary Examiner