May 3, 1955 G. F. ROONEY, JR 2,707,415

SHEET INSPECTING DEVICE

Filed May 28, 1953 2 Sheets-Sheet 1

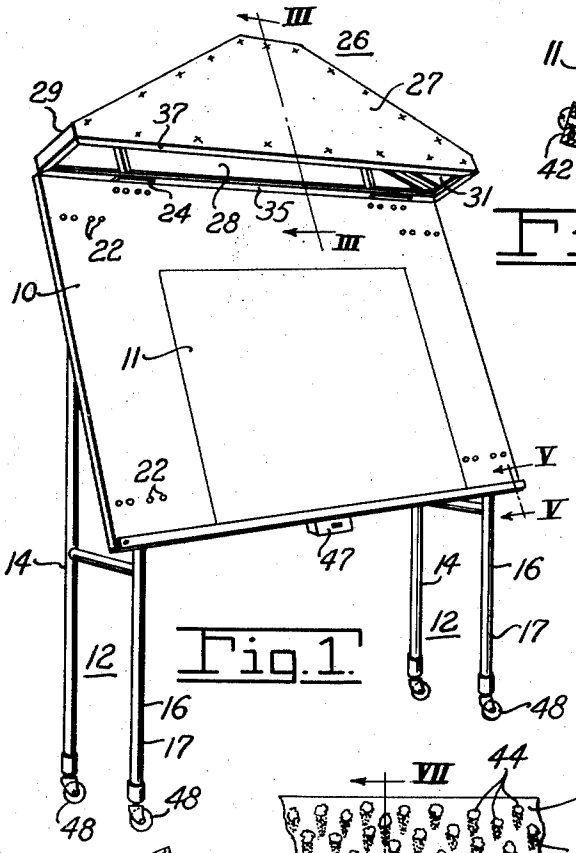


Fig. 1.

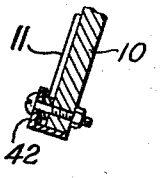


Fig. 5.

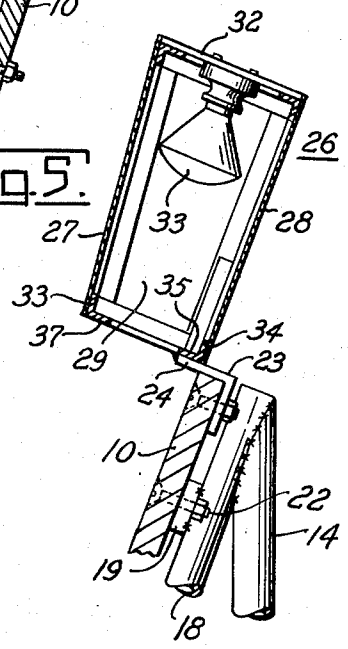


Fig. 3.

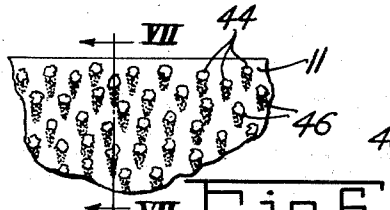


Fig. 6.

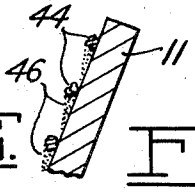


Fig. 7.

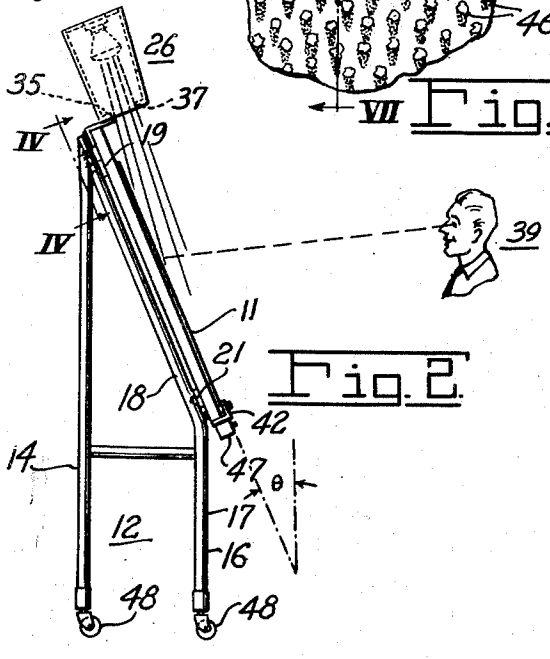


Fig. 2.

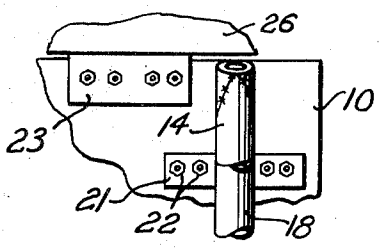


Fig. 4.

INVENTOR.
GEORGE F. ROONEY, JR.
BY
Zugelter & Zugelter
Attys.

May 3, 1955 G. F. ROONEY, JR 2,707,415

SHEET INSPECTING DEVICE

Filed May 28, 1953 2 Sheets-Sheet 2

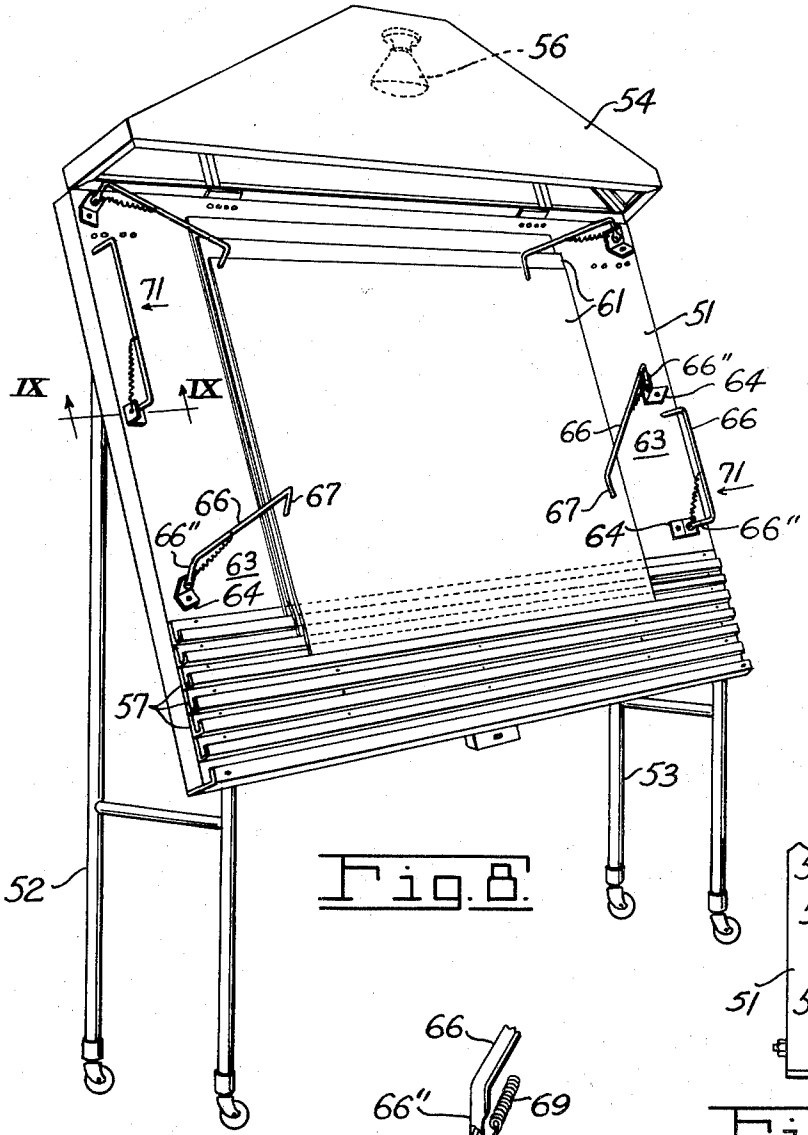


Fig. 8.

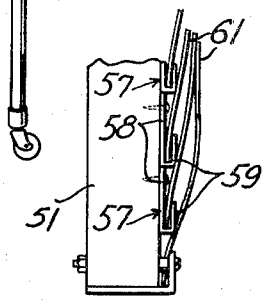


Fig. 10.

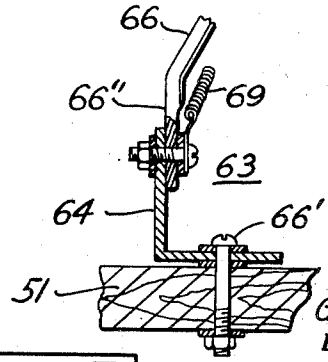


Fig. 9.

INVENTOR.
GEORGE F. ROONEY, JR.
BY
Zugelter & Zugelter
Attys.

United States Patent Office 2,707,415 Patented May 3, 1955

2,707,415

SHEET INSPECTING DEVICE

George F. Rooney, Jr., Cincinnati, Ohio

Application May 28, 1953, Serial No. 358,028

2 Claims. (Cl. 88—14)

This invention relates to a device for inspecting printed sheets, and more particularly to an illuminated sheet holder constructed to sharply reveal powder particles on the surface of a printed sheet.

Powder particles are deposited on printed sheets before the sheets are stacked to prevent offset printing and smearing of the printing during stacking.

An object of this invention is to provide a device for holding a printed sheet which has been dusted on its face with powder particles or granules at a predetermined angle and which is provided with means for projecting rays of light along and substantially parallel to the face, to cause the powder granules to cast relatively long shadows, with upper sides of the particles being illuminated and the lower sides being in shadow whereby the uniformity of dispersal of the powder granules over the surface can readily be seen on visual inspeciton.

A further object of this invention is to provide a device of this type in which the illuminating fixture is shaded or hooded so that the light thereof is projected along the face of the paper and is prevented from being projected into the observer's eyes.

A further object of this invention is to provide a sheet-holding board having an inclined face on which a printed sheet is supported provided with a light source for projecting light along the printed sheet so that the shadows cast by the powder granules are readily discernible.

From the following detailed description, and the accompanying drawings, the above and other objects and features of the invention will be apparent to those having ordinary skill in the art to which it pertains.

In the drawings:

Figure 1 is a perspective view showing a sheet-holding device constructed in accordance with an embodiment of this invention with a printed sheet mounted on the device;

Fig. 2 is a view in side elevation of the device;

Fig. 3 is a view in section taken along a line III—III in Fig. 1;

Fig. 4 is an enlarged fragmentary view in section taken along a line IV—IV in Fig. 2;

Fig. 5 is an enlarged fragmentary view in section taken along a line V—V in Fig. 1;

Fig. 6 is an enlarged fragmentary diagrammatic view of a portion of a printed sheet on the device;

Fig. 7 is a fragmentary view in section taken on a line VII—VII in Fig. 6;

Fig. 8 is a perspective view showing a sheet-holding device constructed in accordance with another embodiment of this invention with a plurality of sheets mounted thereon;

Fig. 9 is a view in section taken on a line IX—IX in Fig. 8; and

Fig. 10 is a fragmentary view in side elevation of the device shown in Fig. 8.

In the following detailed description, and the drawings, like reference characters indicate like parts.

As illustrated in Figs. 1 and 2, the device includes a rectangular board **10** which is adapted to support a printed sheet **11**. The board is mounted on frame members **12**. Each frame member **12** includes a rear upright **14** and a forward member **16**. As shown in Fig. 2, the forward member **16** includes an upright portion **17** and a sloping portion **18**. Upper ends of the frame members **14** and **16** of each frame member **12** are welded together, and the sloping portion **18** of each forward member **16** carries spaced plates **19** and **21** welded thereto. The board **10** is attached to the plates **19** and **21** by means of bolts **22**.

Angle members **23** are attached to the upper edge of the board **10** with a portion of one flange **24** of each angle member projecting above the face of the board. The angle members **23** are mounting brackets for a hood **26**. The hood **26** includes front and back panels indicated at **27** and **28**, respectively, end panels **29** and **31**, and a bracket **32** at the top thereof. The bracket **32** supports an illuminating lamp **33**, which may be of the type commonly referred to as a "photo-flood" lamp.

The lower side of the hood **26** is open but the width of the opening is limited by angle members **33** and **34** attached along opposite edges thereof. As shown, the inwardly projecting flange **35** of angle **34** shades the upper end of the board so that the lamp does not produce a glare along the upper edge of the board above the printed sheet **11**. The inwardly projecting flange **37** of angle **33** prevents direct light from the lamp reaching the eyes of an observer **39** (Fig. 2). In addition, the back panel **28** is painted with a flat black paint to minimize glare on the back panel.

The printed sheet **11** is supported on the board **10** by an angle member **42** (Fig. 5). The angle member **42** is attached to the lower edge of the board **10** with one flange of member **42** parallel to and spaced from the board while the other flange underlies the lower edge of the board.

The lamp **33** is constructed to project light along the face of the printed sheet **11**. The lamp projects light nearly parallel to the face of the printed sheet, as indicated by the light rays shown in Fig. 2 with the light reaching the face of printed sheet **11** at such an angle that, as indicated in Figs. 6 and 7, the light illuminates the upper edges of powder particles **44** and causes the particles to cast elongated shadows **46** extending downwardly along the printed sheet. Upper faces of the particles are illuminated and the lower faces of the particles are in shadow. The shadows make the particles sharply and clearly distinguishable to the eyes of the observer **39** (Fig. 2).

As shown in Fig. 2, the board is mounted at an angle θ of approximately 22 degrees to the vertical, so that the shadows and the shadow faces of the particles are clearly distinguishable.

A switch **47**, of conventional form, is attached to the lower edge of the board, and the switch **47** is connected to the lamp **33** and to a source of electric power by leads which are not shown, so that the lamp may be turned off and on by means of switch **47**.

The lower ends of frame members **14** and **16** are carried by casters **48** so that the board may be turned in such a direction as to eliminate extraneous light falling on the face of the board.

The device illustrated in Figs. 8–10 inclusive includes a board **51** mounted on support frames **52** and **53**. A hood **54** is mounted along the upper edge of board **51**, and a lamp **56** inside the hood projects light along the upper face of the board.

A plurality of sheet-holding brackets **57** of J-shape in section are attached to the board, one above the other along the lower edge thereof. As shown in Fig. 10, each bracket **57** includes a long arm **58** attached to the board and a return bent arm **59** extending outwardly and upwardly to form a groove for receiving an edge of a sheet **61** mounted on the board. As shown in Fig. 8, the sheets

61 are supported on the board with the upper edge of each sheet visible. When a plurality of sheets are mounted on the board, the exposed portions of the sheets on the board can be examined and compared to determine if the density of powder spray is uniform on all sheets.

The sheets are held down on the face of the board by hold-down assemblies 63. Each of the assemblies 63 includes an angle bracket 64 and a pivotally mounted sheet-holding member 66. As shown in Fig. 9, the angle bracket 64 is pivotally mounted on a bolt 66' which projects through one flange of the bracket 64 and through the board 51. The member 66 is U-shaped as shown in Fig. 8.

One arm 66'' of the U-shaped member is pivotally attached to the other flange of bracket 64, as shown in Fig. 9. The free arm 67 of each member 66 is engageable with the sheets 61. A spring 69 holds the arm 67 in engagement with the sheets. The sheet-holding members can be swung upwardly away from the sheets to release the sheets and can be swung aside to the position shown at 71 to be out of the way of the sheets.

The devices of this invention are particularly designed for use in examining sheets coated with starch particles or the like and serve to sharply reveal the particles. However, the devices also may be used to examine sheets coated with other materials, such as wax sprays and other sprays. In addition, the devices can be used to compare the color of sheets. If desired, a colored lamp, an ultra violet lamp, an infra red lamp, or a fluorescent lamp may be used in the hood for casting light of a selected type on the sheets for comparison or examination thereof. In addition, the devices may be used to examine sheets of paper, cardboard, or other sheet material for embossing or surface imperfections.

The devices illustrated in the drawings and described above are subject to structural modification without departing from the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device for supporting a plurality of elongated powder-coated printed sheets for visual inspection which comprises a substantially rectangular board, means for supporting said board with its face in a sloping position, a plurality of parallel sheet-holding members attached to the board one above the other adjacent the lower edge of the board, said sheet-holding members being adapted to support the sheets on the board in overlapping relation, a plurality of sheet-hold-down members mounted on said board and adapted to engage the faces of the sheets to hold the sheets substantially flatwise against the board, a hood attached to the upper edge of the board, said hood having a downwardly facing opening along the upper edge of the board and means in the hood for projecting light through the opening along the face of the board, whereby the light illuminates the upper edges of the powder particles on the sheet, causing the particles to cast elongated shadows extending downwardly along the board.

2. A device for supporting and illuminating a powder-coated printed sheet for visual inspection which comprises a substantially rectangular board, means for supporting said board with its face in a sloping position, a sheet-holding member attached to the board adjacent the lower edge thereof, a plurality of sheet hold-down members mounted on said board for engaging the face of the sheet to hold it substantially flatwise against the board, a hood attached to the upper edge of the board, said hood having a downwardly facing opening along the upper edge of the board and a lamp in the hood for projecting light through the opening along the face of the board, whereby the light illuminates the upper edges of the powder particles on the sheet, causing the particles to cast elongated shadows extending downwardly along the board.

References Cited in the file of this patent

UNITED STATES PATENTS

1,230,102	Bottum	June 19, 1917
1,846,533	Thompson	Feb. 23, 1932
2,099,012	Goodrich et al.	Nov. 16, 1937
2,104,079	Kahn	Jan. 4, 1938

FOREIGN PATENTS

447,171	Great Britain	May 13, 1936