Oct. 27, 1964 F. E. TWEED 3,154,197

MATERIALS HANDLING TRAY

Filed April 4, 1963 2 Sheets-Sheet 1

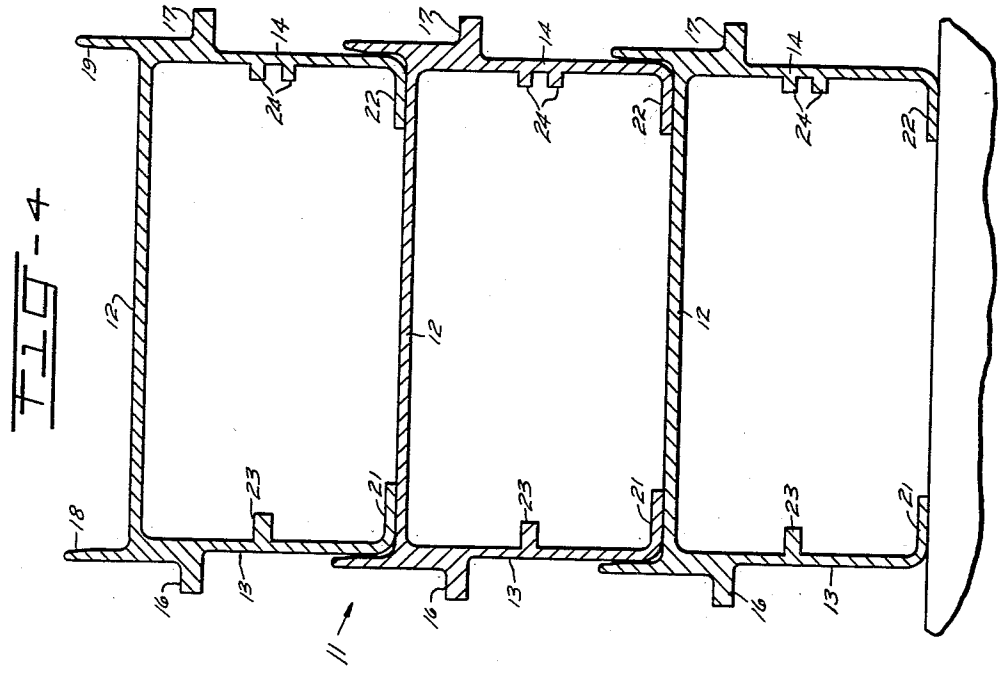


FIG-4

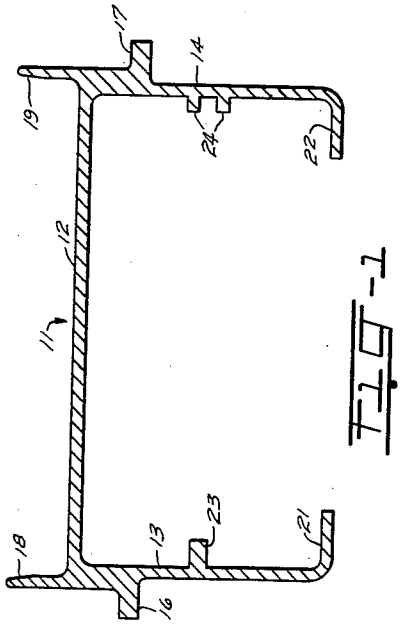


FIG-1

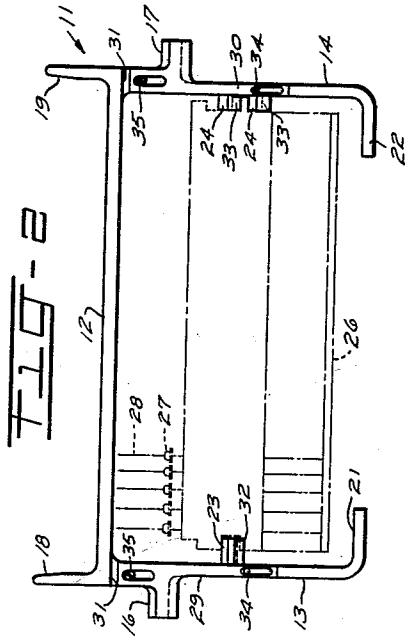


FIG-2

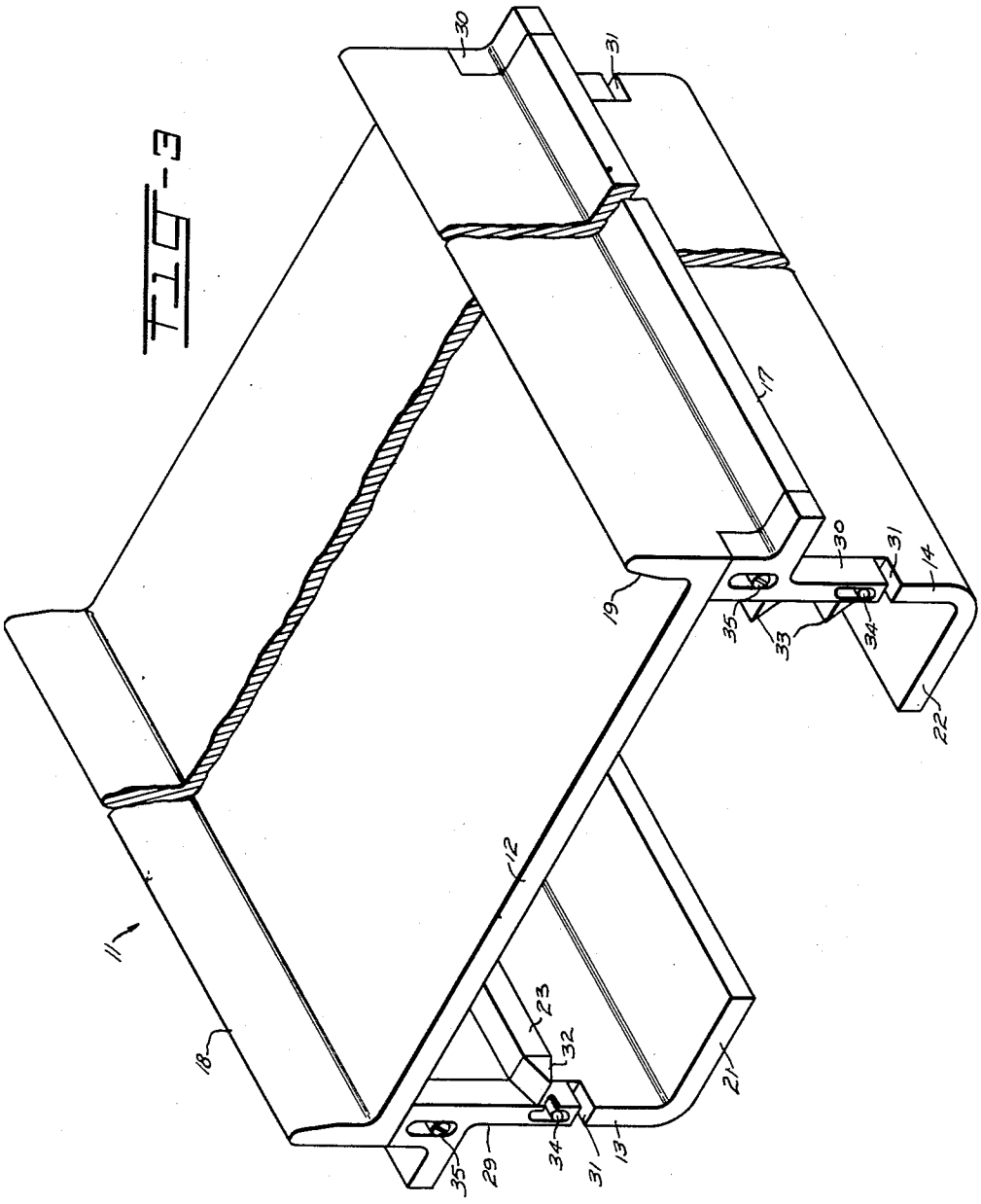
INVENTOR
F. E. TWEED
BY A. J. Nugent
ATTORNEY

Oct. 27, 1964 F. E. TWEED 3,154,197

MATERIALS HANDLING TRAY

Filed April 4, 1963 2 Sheets-Sheet 2

FIG-3



United States Patent Office 3,154,197 Patented Oct. 27, 1964

3,154,197

MATERIALS HANDLING TRAY

Francis E. Tweed, Reading, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y., a corporation of New York

Filed Apr. 4, 1963, Ser. No. 270,682
8 Claims. (Cl. 211—126)

This invention relates to a novel materials handling tray and, particularly but not necessarily exclusively, to a tray of this nature which is peculiarly adaptable for use in a substantially automated, multi-operation manufacturing process in conjunction with the effective and protective transportation and storage with minimum space requirements of structurally compatible articles therewithin.

It is an object of my invention to provide a materials handling tray as above of economical and durable design and construction which embodies significant space-saving features in the design thereof.

A further object of my invention is the provision of a tray as above which incorporates complementary design features whereby a plurality of the trays may be effectively interlocked and stacked for storage with minimum space requirements.

Another object of my invention is the provision of a tray as above which incorporates self-contained article guide and support and locking features whereby structurally compatible articles may be effectively inserted, supported and maintained therewithin.

In a preferred embodiment herein disclosed, the tray of my invention will be seen to be designed for the receipt and support of other structurally compatible material handling means, as for example the materials handling racks which form the subject matter of my copending application Serial No. 268,896, and to comprise an inverted, generally U-shaped frame member. Complementary shaped flanges and bent-over lip portions are formed at opposite extremities of the frame member whereby a plurality of the trays may be stacked in an interlocked relationship. Guide and support means, incorporating a self-locking design feature, are provided on opposite interior walls of the tray whereby the said materials handling means may be supported and maintained therewithin.

The above and other objects and advantages of my invention are believed made clear by the following detailed description thereof taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a cross-sectional view taken through the center of the tray;

FIG. 2 is an end plan view with the self-contained locks depicted in the closed position and includes the depiction of further materials handling means supported therewithin;

FIG. 3 is an isometric view with the self-contained locks depicted in the open position, and

FIG. 4 is a cross-sectional view of a plurality of the trays positioned in a stacked interlocked relationship.

Turning now to the drawings, the herein-disclosed preferred embodiment of my invention will be seen to take the form of an inverted, generally U-shaped frame member **11** comprising top portion **12** with leg portions **13** and **14** extending therefrom. Handling flanges **16** and **17** are formed on the exterior surfaces of the respective leg portions and extend the entire lengths thereof whereby the trays may be conveniently gripped for handling. Flange-like leg portion extensions **18** and **19**, and complementary shaped bent-over lip portions **21** and **22**, respectively, are formed as shown at opposite ends of the leg portions whereby a plurality of the trays may be stacked in a stable interlocked relationship with minimum space requirements in the manner depicted in FIG. 4.

Article guide and support means **23** and **24** are formed as shown on the interior walls of the leg portions whereby structurally compatible articles may be guided and supported therewithin. In the herein-disclosed preferred embodiment of my invention, these means will be seen to take the form of complementary shaped tongue and groove configurations, respectively, whereby the complementary shaped end portions of, for example, the materials handling rack of my aforementioned copending application, may be guided and supported thereby. In this regard, a rack **26** of this nature is depicted in FIG. 2 in the position assumed thereby within the tray. Diode stud assembly **27**, comprising thin whisker leads **28**, are in turn depicted as supported within the rack whereby it is made clear that the top portion **12** of the tray functions as a protective cover to prevent any damaging contact with the thin whisker leads of the diode stud assemblies supported within the tray. Further, it may be noted that the complementary shapes of the guide and support means of the herein-disclosed preferred embodiment, and the end portions of the racks, enable the former to function in the manner of a guide and rail system whereby the tray may be readily coordinated with the input and output stations of diode assembly machines and the racks automatically transferred between the trays and the said stations during the performance of a substantially automated, multi-operation diode manufacturing process.

Self-contained profile locks **29** and **30** are seen in FIGS. 2 and 3 to be located in slots **31** at the ends of the leg portions, and to comprise guide and support means extensions **32** and **33**, respectively, formed therein. The profile locks are slightly shorter than but otherwise identical in shape to the portions of the tray into which they are fitted, and are slidably attached thereto by pins **34** and locking screws **35** extending therebetween in the depicted mounting holes provided therefor. The locks may be positioned in either of the extreme upward position of FIG. 3—the open position—or the extreme downward position of FIG. 2—the closed position—by the manual adjustment thereof and tightening of the locking screws **35**. Alternatively, the locks may be spring loaded in any obvious manner to either one of the above-mentioned positions whereby the manual adjustment thereof will become necessary only in those cases where the other position is desired. In the open position, the guide and support means extensions **32** and **33** are in alignment with the guide and support means to thus present a smooth profile to the insertion and withdrawal of the racks from the tray. In the closed position, the extensions are not in alignment with the guide and support means and thus function, in the manner depicted in FIG. 2, to prevent the withdrawal of racks from the tray as should be obvious. Thus, it may be appreciated wherein the trays may be loaded with racks and the locks placed and tightened in the closed position whereupon the trays may be readily handled without fear of the racks falling therefrom.

Significant space-saving features of my invention are believed made apparent by the design of the herein-disclosed preferred embodiment whereby it is seen that the extent of the tray is made just sufficient to maintain and protect the diode-loaded racks supported therewithin, while at the same time providing the desirable stacking, handling, and locking features set forth hereinabove. It should further become apparent that the design of the tray and the guide and support means may be readily modified in accordance with the size and shape of the articles to be supported and maintained therewithin whereby the size of the tray may be kept to an absolute minimum commensurate with the size of the articles.

While I have described the herein-disclosed preferred embodiment of my invention in detail, it will become ob-

vious to those skilled in this art, after reading this description, that various changes and modifications, in addition to those of size and shape mentioned hereinabove may be made therein without departing from the spirit and scope thereof. It is, therefore, intended that the matter contained in the foregoing description and annexed drawings be interpreted as illustrative only, and not in a limiting sense, when consideration is given to the appended claims.

What is claimed is:

1. In a materials handling tray for the support of articles therewithin:

a generally U-shaped frame member comprising a top portion and leg portions extending therefrom,

said leg portions having interior and exterior surfaces,

complementary shaped means formed at the upper and lower extremities of the leg portions whereby a plurality of the trays may be placed in an interlocked stacked relationship, and

guide and support means formed on the interior surfaces of the leg portions below the top portion,

said guide and support means having shapes which are complementary to the shapes of at least portions of the articles to be supported within the trays whereby the said article portions may be interlocked with the guide and support means to thus guide and support the articles within the tray.

2. In a tray as in claim 1 wherein:

the said complementary shaped leg portions and the guide and support means are integral with and extend the entire lengths of the respective leg portions.

3. In a tray as in claim 1 further comprising:

locking means formed on the leg portions whereby articles supported within the tray may be locked therein.

4. In a materials handling tray for the support of articles therewithin:

a generally U-shaped frame member comprising a top portion and integral leg portions extending downwardly therefrom,

said leg portions having interior and exterior surfaces,

integral flange-like extensions formed on the upper extremities of the leg portions at the junctures thereof of the top portions and extending upwardly therefrom,

complementary shaped bent-over lip portions formed on the lower extremities of the leg portions whereby a plurality of the trays may be placed in a stacked interlocked relationship by positioning the bent-over lip portions of one tray on the top portion and between the flange-like extensions of another,

handle means formed on and extending from the exterior surfaces of the leg portions, and

article guide and support means formed on the interior surfaces of the leg portions,

said guide and support means having shapes which are complementary to the shapes of at least portions of the articles to be supported within the tray whereby

the said article portions may be interlocked with the guide and support means to guide and support the articles in a protected manner within the tray below the top portion thereof.

5. In a tray as in claim 4 wherein:

the articles to be supported within the tray comprise materials handling racks.

6. In a tray as in claim 4 wherein:

the flange-like extensions, the bent-over lip portions, and the guide and support means extend the entire lengths of the leg portions, and

the leg portions further comprise locking means positioned at the ends thereof whereby articles supported within the tray may be locked therewithin.

7. In a materials handling tray for the support therewithin of materials handling racks which comprise tongue and groove portions formed at opposite ends thereof,

a generally U-shaped frame member comprising a top portion with two integral leg portions extending downwardly from opposite edges thereof,

said leg portions having interior and exterior surfaces in relation to the tray,

flange-like extensions formed on and extending upwardly from the upper extremities of the leg portions at the junctures thereof with the edges of the top portion,

complementary shaped ben-over lip portions formed at the lower extremities of the leg portions whereby a plurality of the trays may be placed in a stacked interlocked relationship by positioning the bent-over lip portions of one tray on the top portion and between the flange-like extensions of another,

article guide and support means formed on the interior surfaces of the leg portion,

said guide and support means comprising tongue and groove configurations, respectively, of shapes complementary to the respective tongue and groove portions of the racks whereby the latter may be interlocked with the former and guided and supported thereby within the tray,

slots formed in the ends of the leg portions, and

locking means slidably mounted and movable therein to at least an open and a closed position whereby articles supported within the tray may be locked therewithin by movement of the locking means to the closed position.

8. In a device as in claim 7 wherein:

the locking means comprise profile locks which include extensions of the guide and support means,

said extensions being in alignment with the guide and support means in the open position of the locking means and not in alignment therewith in the closed position thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,814,252	Leary	July 14, 1931
2,729,498	Law	Jan. 3, 1956