Dec. 22, 1953

I. NEWMAN

2,663,603

LAP TRAY WITH LEG ENGAGING MEANS

Filed June 16, 1950

Fig. 1.

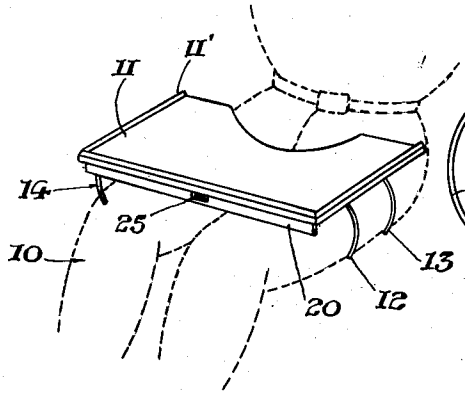


Fig. 2.

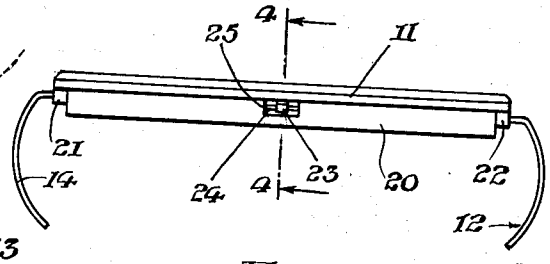


Fig. 3.

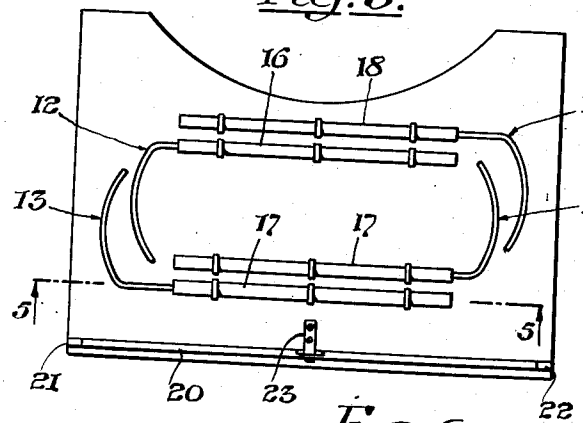


Fig. 9.

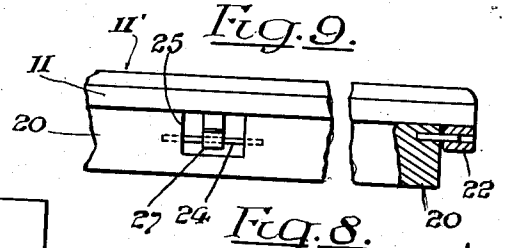


Fig. 8.

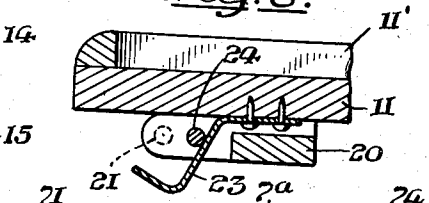
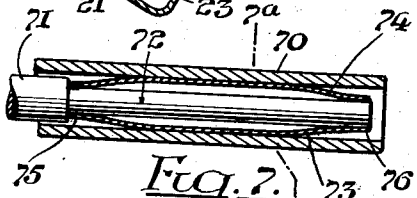


Fig. 4.

Fig. 7.



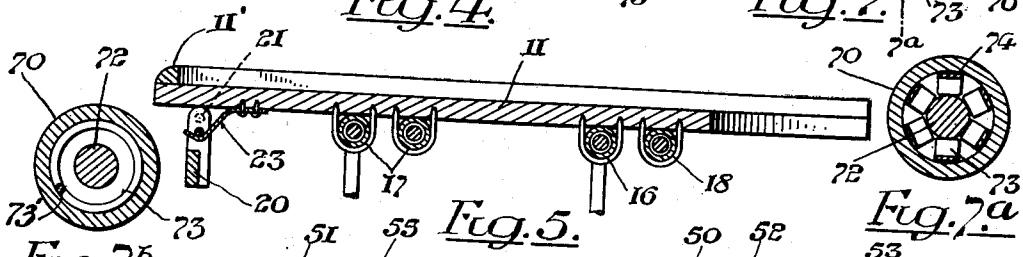
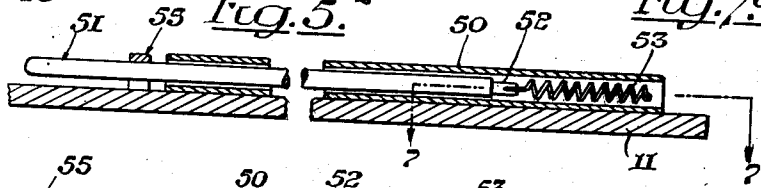


Fig. 7b

Fig. 7a

Fig. 5.



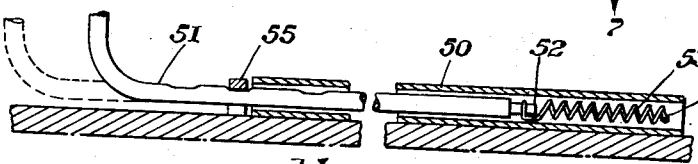


Fig. 6.

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LAP TRAY WITH LEG ENGAGING MEANS

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Application June 16, 1950, Serial No. 168,609

1 Claim. (Cl. 311—23)

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This invention relates to trays and in particular to a lap tray which can be firmly held upon a user's lap.

In the ordinary household many situations arise in which food will be served away from the table. The problems thus created for the individual required to "balance the tea cup" are many, and have been the subject of much humor but of little attempt at solution. The recognition of the situation is substantially universal but attempts to relieve the distress of the individual subjected to this kind of social treatment have been absent.

It is, accordingly, a fundamental object of the instant invention to provide a lap tray which will solve the balancing problems accompanying the service of refreshment away from the conventional table.

It is a second object of the invention to provide a lap tray which will be useful in holding material on a user's lap and will also be compact enough to permit the average hostess to own and store a substantial number thereof.

It is a further object of the invention to provide a lap tray useful for furnishing a convenient surface in the lap of the user.

It is a further object of the invention to provide a lap tray which takes into account the provision of a substantially level surface at the user's lap.

Other objects and advantages of the invention will in part be obvious and in part appear hereinafter.

The invention accordingly comprises a tray providing a surface and means on the lower side of said tray to clamp the article to a user's lap firmly yet with sufficient resiliency to provide for a moderate amount of movement, which structure is characterized by having a pair of clamps usable to grasp a user's knees, the clamps being holdable or collapsible into a tube. The invention thus comprises a tray having leveling means and knee clamping means hereinafter to be described, which invention is characterized by the features of construction, combinations of elements and arrangement of parts to be described in greater detail in conjunction with the accompanying drawings.

In those accompanying drawings:

Figure 1 is a general illustration of the lap tray in use;

Figure 2 is a front elevation of the tray showing the knee grasping means and the leveling device;

Figure 3 is an elevation of the underside of the

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tray showing the structure and arrangement of parts thereon;

Figure 4 is a section taken along the line 4—4 of Figure 2 showing a method of mounting the device on the tray;

Figure 5 is a section taken longitudinally through a typical one of the knee grasping devices;

Figure 6 supplements Figure 5 in showing how the knee grasping device is mounted and can be used;

Figure 7 is a longitudinal section through an alternative form of the device;

Figures 7*a* and 7*b* are cross sections through an alternative form of the device;

Figure 8 is a detailed section showing the mounting of the leveling means; and

Figure 9 is a fragmentary front elevation showing the mounting of the leveling means on the device.

Referring back now to Figure 1, **10** represents an individual seated with the tray **11** fixed in his lay in a position representing a normal use of the device.

In Figures 1 and 2 there can be seen the various elements making up the tray. Thus **12**, **13**, **14** and **15** represent generally L-shaped knee clamping means which are resiliently mounted in essentially tubular units **16**, **17**, **18** and **19** on the back face of the tray.

Taking into account the fact that in an average sitting position, an individual lap will be inclined slightly forward, the hinged leveling means **20** is provided on the bottom surface of the tray. In order to hold the hinged piece firmly in raised or leveling position, fastening means **23** is provided in the form of a small band spring bent to bear on cross bar **24** in the opening **25** of the leveling means. The detail of this structure is shown in Figures 8 and 9.

The detailed structure of the knee clamping means is shown in Figure 5, where **11** represents the tray and **50** any one of the tubes mounting the knee clamping device. It should be apparent that the tube may be a separate piece or it may be formed integrally with the tray itself. The knee clamping piece **51** slides in the tube and carries a boss **52** on the end thereof to which spring **53** is attached. The opposite end of spring **53** is fastened close to the end of tube **50** to develop the desired amount of tension and cause the normal position of the knee clamping device to be one in which it is held in position well in the tube so that the ends thereof do not project out from the edges of the tray. Spring **53** is made

short enough to supply the necessary tension to hold the grasping device in the withdrawn position shown in Figure 5. For convenience in storage and to assure the retention of the knee clamp 51 in flat position shown in Figure 3, it is desirable to have the spring 53 also exert a rotational force so that during intervals when the tray is not being used the spring not only retains piece 51 drawn into the tube but also turns it over into the flat storage position shown. This is accomplished by mounting the spring as shown in Figure 6 where a spring 53 is put through the boss 52 in one position and the desired amount of torsional force applied thereto before fastening the other end at 54. In this fashion the normal position of grasping device 51 will be in the flat position for storage. For added convenience, the thickness of the leveling means 20 is made to correspond to the diameter of the tube 50 so that when the device is laid flat, no one element on the back face thereof causes the stack to be thrown out of level. The provision of the border 11' around the upper surface of the tray aids in making a neat stack.

In Figure 4 the general cross section of the device is shown in which the tray 11 having a border 11' on its upper face carries the several tubes mounting the knee clamp device on the lower face shown. This embodiment is that in which the tubes constitute separate pieces and are fastened to the back face of the tray. Also appearing in this embodiment is a leveling device 20 and the flat spring mechanism 23 for holding it in position.

In view of the fact that extension of clamping device 51 will cause spring 53 to exert a given amount of tension thereon, it is desirable to overcome this to some extent when the device is extended, and for this purpose a flat spring arrangement 55 corresponding in structure to that shown as 23 is employed by providing small notches or slight reductions in the diameter of any of the knee holding devices. Upon extension thereof and placement of any one of these under spring 55, the knee clamp device can be held in a given fixed position.

An alternative embodiment of the knee clamping spring structure is shown in Figure 7 where 70 represents any one of the tubes mounting a knee clamping device 71, which corresponds to any one of those shown in Figure 3, as 12, 13, 14 or 15. Within the tube, knee clamping device will terminate in an extended piece 72 of diameter reduced from that of the rod itself. Longitudinally aligned along the extension of reduced diameter are flat spring elements 73 and 74, etc. Surrounding the extension 72 and thereby forming a compression spring, elements 73 and 74, are joined to the extension 72 at their ends 75, 76 and raised to a diameter slightly greater than the inside diameter of the tube. The result is that when the knee clamping device carrying this compression spring structure on the end thereof is inserted in the tube, it forms a close resilient friction fit and one which permits the withdrawal of the clamping device 71 to any point and any positioning thereof as desired. The spring structure can be made in a single flat element where the parts 73, 74 etc. are formed by making slits in the flat piece which is thereafter rolled into a cylinder and mounted on the extension 72. This element is shown in cross section in Figure 7a. Thus in Figure 7a the leaves of the compression form of spring attached to 72 and bearing against the tube 70 are shown as a series of six leaves identified generally as 73 and 74. In Figure 7b the variant is one in which the circular spring 73 is a continuous flexible tubular element of somewhat lesser diameter than the tube 70 and which bears against an internal bead 73' which functions as a detent to hold it in any position.

It will be understood, of course, that a similar effect could be obtained by bending a rod 71 or its extension 72 in a large radius so as to provide frictional engagement with the inside wall of the tube 70. Also by making rod 71 a close fit within the tube to provide frictional engagement, a satisfactory result can be achieved.

The operation of the structure should be apparent from the description thereof. It will be seen that the device is shown in Figure 3 substantially as it appears when taken from storage, that is the several knee clamping devices lie flat against the back of the tray to be used when the leveling means 23 is raised and the several knee clamps extended. The device is then placed on the knees where any further adpjustment can be made. When it is desired to discontinue use, it is removed from the knees and simply by turning the knee clamping elements to the flat position, the several springs will retract them into the storage positions designed therefor.

It will be apparent that the device has utility as a convenient lap tray for service of foods and refreshment both within the home and for picnic purposes. Similarly, where large numbers are to be served, its utility becomes apparent in that it provides a convenient level surface which the user can take advantage of for consumption of his refreshment.

Though the invention has been described with only a single embodiment it is apparent from the description that other variations can be made without departing from the spirit or scope of the invention except as limited by the claim.

What is claimed is:

A lap tray comprising a sheet defining an upper and a lower surface, a plurality of clamping devices mounted on the lower surface thereof, said devices comprising L-shaped members mounted in guide tubes and having outwardly extending portions thereof in an arcuate form, each guide tube also enclosing a spring, one end of which is attached to a clamping device, the other end being attached to a fixed point on the enclosing tube to render the device retractable said lower surface also carrying at each tube a lever resiliently mounted to contact the clamping device and retain it in a given extended position.

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