June 30, 1970 F. L. GRAHAM 3,517,935

CHESSMEN AND PACKAGE CONTAINING SAME

Filed June 27, 1967 3 Sheets-Sheet 1

Fig. 1.

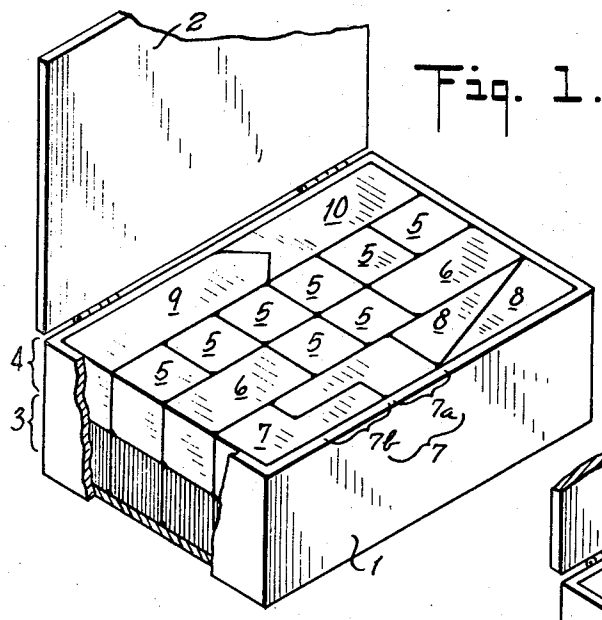


Fig. 2.

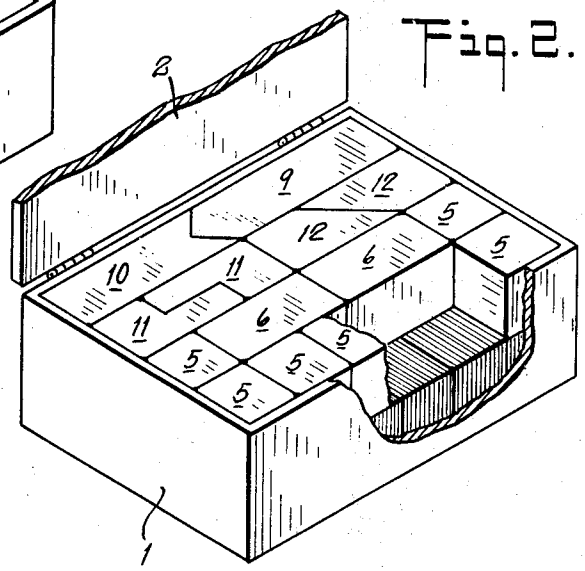


Fig. 3.

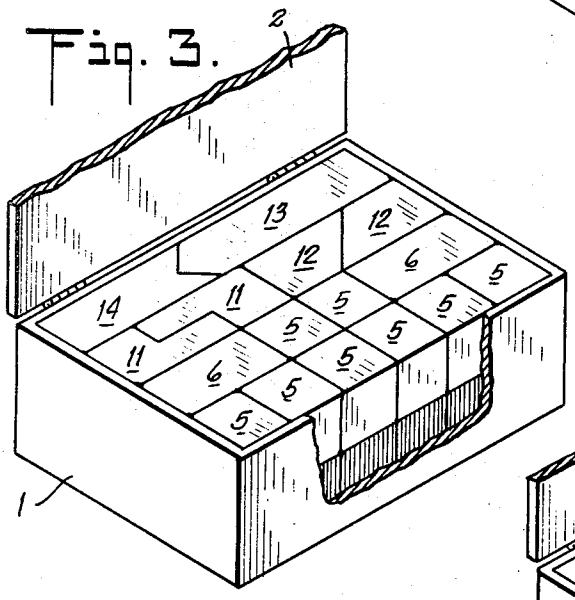
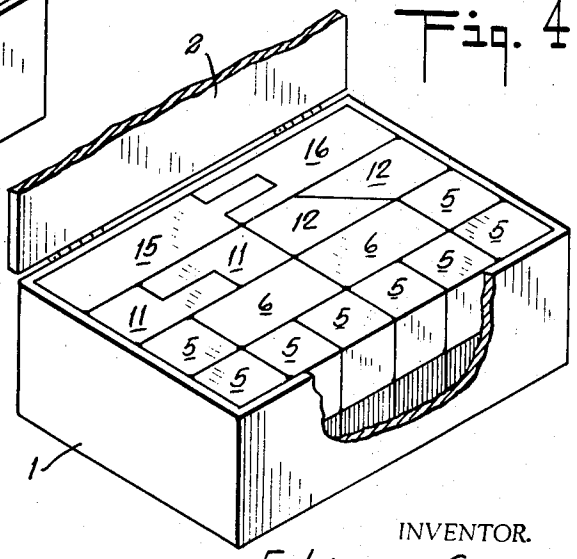


Fig. 4.



INVENTOR.
F. LANIER GRAHAM
BY Lester W. Clark
ATTORNEY

June 30, 1970 F. L. GRAHAM 3,517,935

CHESSMEN AND PACKAGE CONTAINING SAME

Filed June 27, 1967 3 Sheets-Sheet 2

Fig. 5.

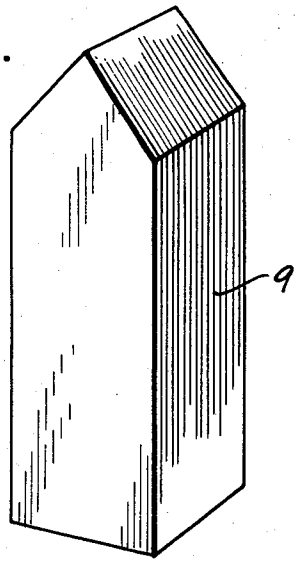


Fig. 6.

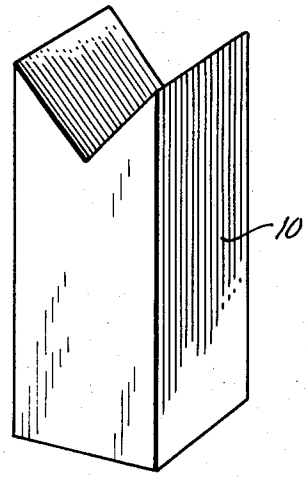


Fig. 7.

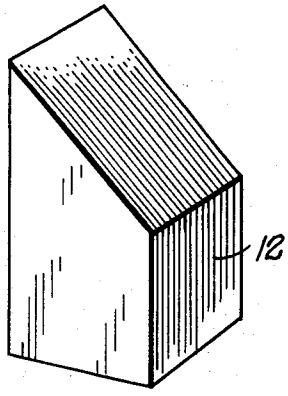


Fig. 8.

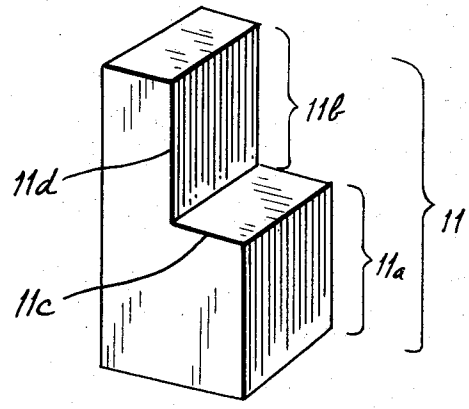


Fig. 10.

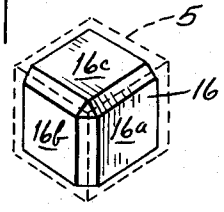


Fig. 9.

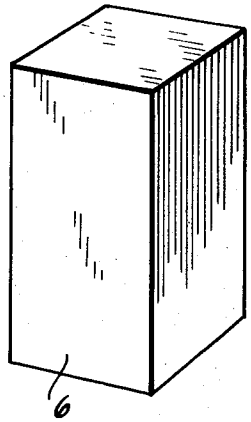
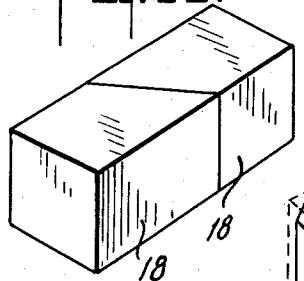


Fig. 12.



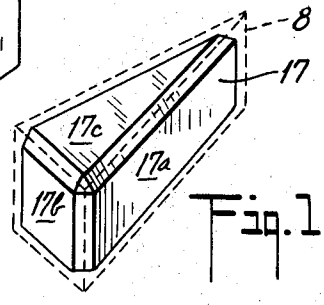


Fig. 11

June 30, 1970 F. L. GRAHAM 3,517,935

CHESSMEN AND PACKAGE CONTAINING SAME

Filed June 27, 1967 3 Sheets-Sheet 3

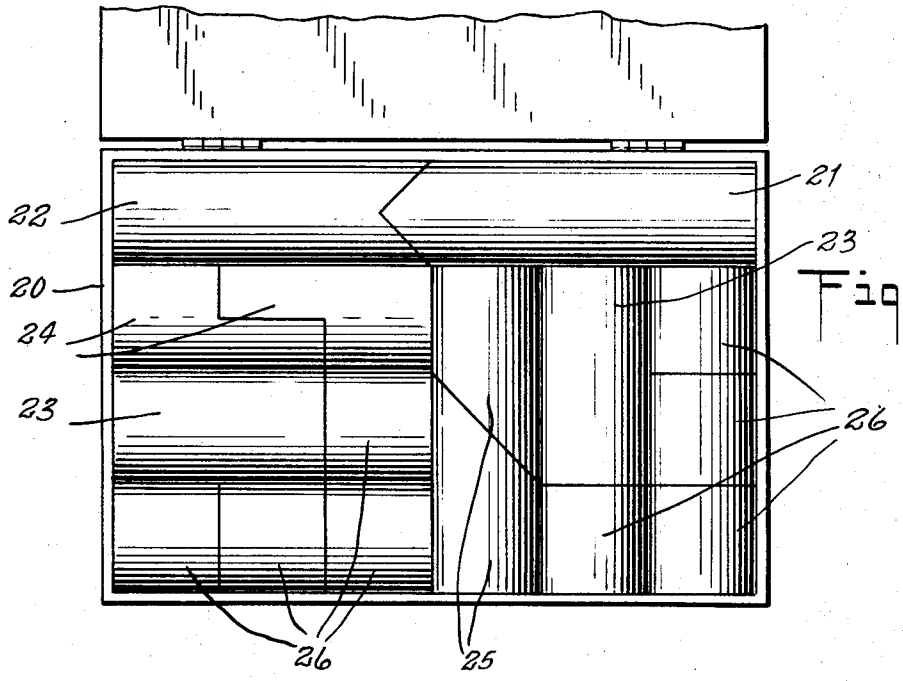


Fig. 13.

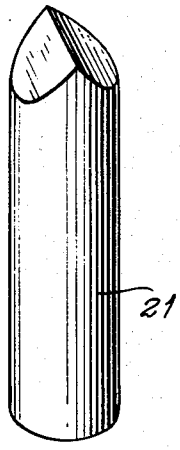


Fig. 14.

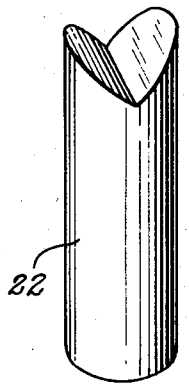


Fig. 15.

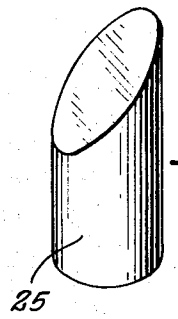


Fig. 16.

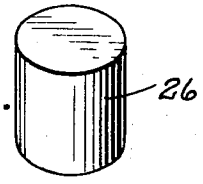


Fig. 19.



Fig. 18.

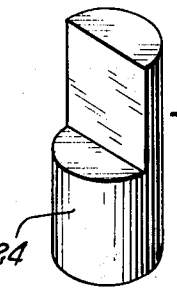


Fig. 17.

United States Patent Office 3,517,935 Patented June 30, 1970

3,517,935

CHESSMEN AND PACKAGE CONTAINING SAME

Floyd Lanier Graham, 20 W. 76th St., New York, N.Y. 10023

Filed June 27, 1967, Ser. No. 649,171
Int. Cl. A63f 3/00
U.S. Cl. 273—137 5 Claims

ABSTRACT OF THE DISCLOSURE

Set of chessmen having individual pieces so formed that a double set fits neatly and tightly into a box of simple shape such as a rectangular parallelepiped. The chessmen are constructed in pairs having complementary surfaces such that each assembled pair is a rectangular parallelepiped. The transverse area of each assembled pair is the same; the length of each assembled pair is a submultiple of the length of the box into which the double set is to fit. The relative heights of the chessmen are indicative of their value in the game; the top portion of at least some pieces is suggestive of their allowed moves.

BACKGROUND OF THE INVENTION

Chessmen generally are carried or stored in packages of one or the other of two types. If the chessmen are structurally simple and made of strong material, the two sets of men necessary to play the game are commonly packaged in a simple box, into which the men are placed in random order. The box is made large enough so that it can hold the chessmen in any tangled order in which they may happen to be inserted. In the other hand, if the chessmen are large, or if they are made of fragile material, they are usually packed in a case having closely fitting recesses and pads provided to receive each piece and hold it against movement while the case is being transported.

It has been proposed to provide a set of chessmen, each of which is marked with a suggestion of the moves which that particular man can make.

BRIEF SUMMARY OF THE INVENTION

The chessmen of the present invention are so formed that a double set fits neatly and tightly into a box of simple shape. In the preferred embodiments, the internal contour of the box is that of a rectangular parallelepiped. In order to make the set of chessmen fit such a box, the chessmen are constructed in pairs having complementary upper end surfaces which enable such a pair to be assembled end to end as a complementary pair. When so assembled, the complementary pair has two flat end surfaces at right angles to the axis of the pair and lateral surfaces defining a region having equal maximum transverse dimensions in two direction perpendicular to each ather and to the aligned axes of the assembled pair. The correspondingly defined regions in all the assembled pairs have equal maximum transverse dimensions.

The tops of the chessmen are formed to suggest the length and direction of the move which the piece may make, and the relative heights of the chessmen indicate their relative power.

DRAWINGS

FIG. 1 is a perspective view of a box containing a double set of chessmen constructed in accordance with the invention, with parts of the box broken away to reveal the contours of the chessmen and one manner in which they may be packed;

FIG. 2 is a view similar to FIG. 1, but showing slightly different proportions for the knights and the bishops;

FIG. 3 is a view similar to FIGS. 1 and 2, showing different proportions for the king and queen;

FIG. 4 is a view similar to FIGS. 1 to 3, showing different configurations in the king and queen;

FIG. 5 is a perspective view of the king according to FIG. 3;

FIG. 6 is a perspective view of the queen of FIG. 3;

FIG. 7 is a perspective view of the bishop;

FIG. 8 is a perspective view of the knight;

FIG. 9 is a perspective view of the rook in FIGS. 1 to 4;

FIG. 10 is a somewhat diagrammatic illustration of a modified form of pawn;

FIG. 11 is a somewhat diagrammatic illustration of a modified form of bishop;

FIG. 12 is a perspective view of two pawns of modified form;

FIG. 13 is a plan view of a box containing a set of chessmen constructed in accordance with a modification of the invention; and

FIGS. 14–19 are perspective views, respectively, of the king, queen, bishop, knight, rook and pawn, in the chessmen of FIG. 13.

DETAILED DESCRIPTION

All of the sets of chessmen described herein have the property of fitting snugly into a container of simple form. While the containers illustrated have the shape of a common box, i.e., a rectangular parallelepiped, other simple shapes may be used, e.g., a cylinder.

The chessmen of FIGS. 1–9 and 12 are designed to fill a reactangular parallelepiped box completely and are based on the principle that each complementary pair of chessmen defines a rectangular parallelepiped so that the box is snugly filled if its dimensions conform to the dimensions of the sum of the parallelepipeds defined by the complementary pairs of chessmen. FIGS. 10 and 11 show modifications of the chessmen of FIGS. 1–9 and 12 which do not fill the box completely, due to beveled edges of the chessmen.

The chessmen of FIGS. 13–19 are based on the principle that each complementary pair of chessmen define a right cylinder. While this set of chessmen does not fill a rectangular parallelepiped box completely, it nevertheless fits snugly into such a box.

Each complementary pair of chessmen may alternatively define other solid figures, e.g., parallelepipeds of hexagonal or octagonal cross-section.

FIGURE 1

There is shown in FIG. 1 a simple rectangular box **1** having a hinged lid **2**. The lid may be held closed by any suitable fastening or locking mechanism (not shown). By a rectangular box is meant one having the internal contour of a rectangular parallelepiped. Within the box are two layers of chessmen, the bottom layer being indicated at **3** and the top layer at **4**. Only the top layer is completely visible. The top layer only will be described in detail, it being assumed that the pieces in the bottom layer, representing the set of men for the opposing player, are the same in form. The set of chessmen in the layer **4** includes eight pawns **5**, each having the form of a cube. Two rooks **6** each have the form of a rectangular parallelepiped equal to two cubes placed side-by-side. Each of the knights **7** consists of a base portion **7***a* of the same dimensions as a pawn **5** and an upwardly projecting flanges **7***b* along one side. The flange **7***b* is somewhat longer than the pawn, being approximately 1½ times the length of one side of the pawn. The bishops are shown at **8**, and are triangular in horizontal cross-section, when lying on their sides, as they appear in the drawing. The height of the bishops is 2½ times the length of the side of one pawn.

The king is shown at **9** and is equal to three pawns placed side-by-side plus a crown consisting of a simple triangular peak having a 90° dihedral angle. The queen is shown at **10** and consists of a base portion equal to two and one-half pawns placed side-by-side plus a crown consisting of two prongs, each having a 45° dihedral angle.

In the conventional language of chess, the word "piece" denotes a chessman other than a pawn. That terminology is employed in this application.

The chessmen in FIG. 1 may be arranged in complementary pairs, so that each pair forms a rectangular parallelepiped. Thus, the two rooks **6** may be placed end-to-end to form a rectangular parallelepiped having the dimension of four pawns placed side-by-side (although the rooks **6** are not so placed in FIG. 1). The two knights **7** may be placed end-to-end, as shown, to form a rectangular parallelepiped having the dimension of three and one-half pawns placed side-by-side. Similarly, the bishops **8** form a rectangular parallelepiped having the dimension of two and one-half pawns. The king and queen together form a rectangular parallelepiped having the dimension of six pawns. Thus, all the pieces together occupy a volume equal to 16 pawns and one complete set of chessmen (8 pieces plus 8 pawns) occupies a space equal to 24 pawns, or one layer in the box **1**.

FIGURE 2

FIG. 2 shows another set of chessmen constructed in accordance with the invention. The pawns **5**, the rooks **6**, the king **9** and the queen **10** have the same shape as in FIG. 1.

The knights **11** in FIG. 2 have a base **11***a* which is the same size as one of the cubes **5** and an upwardly projecting flange **11***b* along one side (see FIG. 8) which is half as thick as the base. Thus, the knight **11** in FIG. 8 may be described as having a cutout in its upper surface, which is one unit wide, as shown at **11***c*, and two units high, as shown at **11***d*. Thus, the contours of the edges **11***c* and **11***d* suggest the knight's move in chess, which is one square in any of the four rectilinear directions from the square in which the knight sits, plus two squares in either direction at right angles to the direction originally chosen. Note that the edge **11***c* is one-half of the length of the edge **11***d*, and that the two edges **11***b* and **11***c* are at right angles to each other.

The bishops **12** in FIG. 2 have a base equal to the volume of a single pawn **5**. The top end of each bishop is mitered at an angle of 45° so as to provide the bishop with a triangular crown with ane side set at a 45° slant. This configuration illustrates the fact that a bishop in chess always moves in a diagonal path. The contour of the top end of the bishops thus suggests the proper move for those pieces. The rooks **6** have a rectangular flat end surface, which suggests that a rook always moves along a rectilinear path parallel to the sides of the board.

FIGURE 3

The set of chessmen shown in FIG. 3 is similar to that shown in FIG. 2, except that the king is made taller, as shown at **13**, and the queen is made shorter, as shown at **14**, in order to make clear the distinction between those two pieces.

The set of chessmen shown in FIG. 3 is the presently preferred embodiment of the invention.

FIGURE 4

This figure illustrates another set of chessmen similar to the sets in FIGS. 2 and 3 except that the king and queen are contoured slightly differently at their upper ends. The king is shown at **15** and has a projecting flange along the middle of its upper surface. The queen is shown at **16** and has two projecting flanges at the sides of the upper surface. The king **15** is taller than the queen **16** by the length of its upper flange.

Since the rooks **6** and the pawns **5** all have flat end surfaces at right angles to their side surfaces, they are

interchangeable when making up complementary pairs to fill the box. Thus two pawns may make up one complementary pair, as in the case of any two adjacent pawns in FIG. 1. Also, two rooks may make up one complementary pair, as in the case of the two rooks **6** in FIG. 2. Alternatively, one rook and one pawn may make up a complementary pair, as in the case of either rook **6** and the pawn **5** adjacent its end in FIG. 3.

FIGURES 5–9

The configurations of the individual pieces of the sets of FIGS. 2 and 3 are illustrated in FIGS. 5–9.

FIGURES 10–11

In all of the embodiments of the invention illustrated above, the space within the box is substantially completely filled. However, it is not necessary that the chessmen be formed so that the space within the box is completely filled.

FIG. 10 shows a pawn **16** which may be substituted for one of the pawns **5** in any of FIGS. 1–4. FIG. 11 shows a bishop **17** which may be substituted for the bishop **8** of FIG. 1. It may be seen that the pawn **16** is derived from the pawn **5**, the latter being shown in dotted lines in FIG. 10, by mitering the rectangular corners. Similarly, the bishop **17** of FIG. 11 is derived from the bishop **8** of FIG. 1 by mitering the corners.

Thus, it is not necessary, to secure snug packing of the chessmen in a rectangular box, that the men have the specific shapes shown in FIGS. 1–8. The pawns do not have to be cubes. For example, they may be rectangular parallelepipeds with one dimension longer than the other two. Alternatively, two pawns **18** may have the forms illustrated in FIG. 12.

Furthermore, the complementary pairs of chessmen do not have to form parallelepipeds. Thus, neither of complementary pair of two pawns **16** nor a complementary pair of two bishops **17** form a parallelepiped.

If the pair of chessmen are to be of rectanglar cross-section, then it is necesary that each chessman have at least four plane surfaces of substantial extent respectively coincident with at least portions of four of the six plane surfaces of a rectangular parallelepiped.

For example, in FIG. 10, the pawn **16** has plane surfaces **16***a*, **16***b*, **16***c* which are respectively coincident with portions of three plane surfaces of the rectangular parallelepiped (cube) corresponding to the pawn **5**, indicated by dotted lines in FIG. 10. The pawn **16** also has three other similar plane surfaces respectively coincident with portions of the other three surfaces of the cube-shaped pawn **5**, which other three surfaces are not visible in FIG. 10. Thus, the pawn **16**, like the pawn **5**, has six plane surfaces respectively coincident with the six surfaces of a rectangular parallelepiped.

In FIG. 11, the bishop **17** has three plane surfaces **17***a*, **17***b*, **17***c*, which are respectively coincident with portions of three of the plane faces of the bishop **8** of FIG. 1. However, only the surfaces **17***b* and **17***c* of those visible in FIG. 11 are coincident with surfaces of a rectangular parallelepiped. The rear surface and the bottom surface, not visible in FIG. 11, also are coincident with portions of the surfaces of a rectangular parallelepiped, so that the bishop **17** has four surfaces which are respectively coincident with portions of four of the six plane surfaces of a rectangular parallepiped.

It is necessary, in constructing a set of chessmen in accordance with the invention, that the upper end of each chessman be so formed that the men together have eight pairs of complementary upper end surfaces, so that the chessmen of each complementary pair may be assembled with their upper end surfaces in engagement and their axes aligned. Typically, for a set of chessmen eight complementary pairs include four pairs of pawns, one pair each of rooks, knights, bishops, and one pair consisting of the king and queen.

Each assembled complementary pair must have lateral surfaces extending at right angles to the bottom surfaces of the pair (which appear as end surfaces when assembled) and of substantial length. These lateral surfaces define in each pair a region having equal maximum transverse dimensions in two directions perpendicular to each other and to the axis of the assembled pair. The corresponding regions in all the assembled pairs must have equal maximum transverse dimensions.

If the chessmen are so designed, then a complete double set is adapted to fit snugly into a space having: (1) a length equal to a multiple of the length of a complementary pair of pawns; and (2) dimensions in two directions perpendicular to each other and to said space length, which dimensions are equal to multiples of the maximum transverse dimensions of an assembled pair.

FIGURES 13–19

These figures illustrate a box **20** in the form of a rectangular parallelepiped, containing a set of chessmen including a king **21**, a queen **22**, two rooks **23**, two knights **24**, two bishops **25** and eight pawns **26**.

Each chessman of this set is generally in the form of a right cylinder. The upper ends of the right cylinders are modified to form complementary pairs of surfaces, so that the chessmen can be put together in complementary pairs to fit snugly into the box **20**. As in the case of the chessmen of FIGS. 1–9, the shapes of the upper ends of the respective chessmen suggest to a player the proper move available to that man.

Furthermore, the lengths of the respective men are roughly proportional to the power of the man.

The cross-sectional dimensions of the men do not need to be the same throughout their length. For example, see the bishop **8** in FIG. 1, the pawn **16** in FIG. 10 and the bishop **17** in FIG. 11. The cross-sectional dimensions may vary in other fashions throughout the length of a particular chessman. For example, some of the men may be provided with peripheral grooves.

In the sets shown, the men of each double set follow a consistent design motif, in that the men of FIGS. 1–9 are based on a rectangular parallelepiped while the men of FIGS. 13–19 are based on a right cylinder. It is not, however, necessary to the invention that all the men of a set be based on the same design motif. For example, the pieces of FIG. 3 could be packed snugly in the same box with the pawns of FIG. 13, or vice versa.

There are many different ways of packing a given set of men constructed in accordance with the invention in a particular box. FIGS. 1–4 illustrate several such ways and FIG. 13 illustrates still another way. The order in which the pieces are placed in the box and their relative positions therein are of no moment as long as they all fit in snugly.

It is preferred to pack chessmen constructed in accordance with the invention in a transparent plastic box in order that they may be observed more readily, but such a box is not a necessary feature of the invention.

Complementary end surfaces, as the term is used in this specification, is intended to be inclusive of flat end surfaces, as on the rooks and pawns. Furthermore, the description of such surfaces as being "in engagement" is intended to be inclusive of surfaces which are simply abutting.

While I have shown and described a preferred embodiment of my invention, other modifications thereof will readily occur to those skilled in the art, and I therefore intend my invention to be limited only by the appended claims.

I claim:

1. A set of chessmen including eight pawns and eight pieces, each chessman having a bottom surface at right angles to the vertical axis of the chessman, a top surface, and side surfaces, wherein the improvement comprises:

(a) means at the upper ends of said chessmen defining eight pairs of complementary upper end surfaces, at least one pair of such surfaces having interfitting contours, so that the chessmen of each complementary pair may be assembled with their upper end surfaces in engagement and their axes aligned;

(b) each said assembled pair having portions of said side surfaces of substantial length defining a region having equal maximum transverse dimensions in two directions perpendicular to each other and to the axis of the assembled pair;

(c) the corresponding regions in all the assembled pairs having equal maximum transverse dimensions;

(d) the eight pawns being adapted to be assembled in four complementary pawn-pairs of equal length; and

(e) the eight pieces having axial dimensions proportioned with respect to the axial dimensions of the pawns so that the pieces may be assembled in four complementary piece-pairs having a total length equal to a multiple of the length of one pawn-pair;

(f) so that the complete set is adapted to fit snugly into a space having a length equal to a multiple of said pawn-pair length and dimensions in two directions perpendicular to each other and to said space length equal to multiples of said maximum transverse dimensions of an assembled pair.

2. A set of chessmen including eight pawns and eight pieces, each chessman having a bottom surface at right angles to the vertical axis of the chessman, a top surface, and side surfaces, wherein the improvement comprises:

(a) means at the upper ends of said chessmen defining eight pairs of complementary upper end surfaces so that the chessmen of each complementary pair may be assembled with their upper end surfaces in engagement and their axes aligned;

(b) each said assembled pair having portions of said side surfaces extending at right angles to the bottom surfaces of the pair and of substantial length, said portions of said side surfaces defining in each pair a region having equal maximum transverse dimensions in two directions perpendicular to each other and to the axis of the assembled pair;

(c) the corresponding regions in all the assembled pairs having equal maximum transverse dimensions;

(d) one of said complementary pairs of pieces comprising two bishops, each having a bottom plane end surface extending at right angles to its axis and a top plane end surface extending at an angle of 45° to its axis;

(e) the eight pawns being adapted to be assembled in four complementary pawn-pairs of equal length; and

(f) the eight pieces being adapted to be assembled in four complementary piece-pairs having a total length equal to a multiple of the length of one pawn-pair;

(g) so that the complete set is adapted to fit snugly into a space having a length equal to a multiple of said pawn-pair length and dimensions in two directions perpendicular to each other and to said space length equal to multiples of said maximum transverse dimensions of an assembled pair.

3. A set of chessmen including eight pawns and eight pieces, each chessman having a bottom surface at right angles to the vertical axis of the chessman, a top surface, and side surfaces, wherein the improvement comprises:

(a) means at the upper ends of said chessmen defining eight pairs of complementary upper end surfaces so that the chessmen of each complementary pair may be assembled with their upper end surfaces in engagement and their axes aligned;

(b) each said assembled pair having portions of said side surfaces extending at right angles to the bottom surfaces of the pair and of substantial length, said portions of said side surfaces defining in each pair a region having equal maximum transverse dimen-

sions in two directions perpendicular to each other and to the axis of the assembled pair;

(c) the corresponding regions in all the assembled pairs having equal maximum transverse dimensions;

(d) one of said complementary pairs of pieces comprising two knights, each having a bottom plane end surface at right angles to its axis; and two top plane end surfaces, parallel to the bottom plane end surface, each top plane end surface being equal to one-half of the bottom plane end surface; one of said two top plane end surfaces being located twice as far from the bottom plane end surface as the other; and an axial plane surface connecting said top plane end surfaces;

(e) the eight pawns being adapted to be assembled in four complementary pawn-pairs of equal length; and

(f) the eight pieces being adapted to be assembled in four complementary piece-pairs having a total length equal to a multiple of the length of one pawn-pair;

(g) so that the complete set is adapted to fit snugly into a space having a length equal to a multiple of said pawn-pair length and dimensions in two directions perpendicular to each other and to said space length equal to multiples of said maximum transverse dimensions of an assembled pair.

4. A set of chessmen including eight pawns and eight pieces, each chessman having a bottom surface at right angles to the vertical axis of the chessman, a top surface, and side surfaces, wherein the improvement comprises:

(a) means at the upper ends of said chessmen defining eight pairs of complementary upper end surfaces so that the chessmen of each complementary pair may be assembled with their upper end surfaces in engagement and their axes aligned;

(b) each said assembled pair having portions of said side surfaces extending at right angles to the bottom surfaces of the pair and of substantial length, said portions of said side surfaces defining in each pair a region having equal maximum transverse dimensions in two directions perpendicular to each other and to the axis of the assembled pair;

(c) the corresponding regions in all the assembled pairs having equal maximum transverse dimensions;

(d) one of said complementary pairs of pieces comprising a king and a queen having complementary interfitting upper end portions;

(e) the eight pawns being adapted to be assembled in four complementary pawn-pairs of equal length; and

(f) the eight pieces being adapted to be assembled in four complementary piece-pairs having a total length equal to a multiple of the length of one pawn-pair;

(g) so that the complete set is adapted to fit snugly into a space having a length equal to a multiple of said

pawn-pair length and dimensions in two directions perpendicular to each other and to said space length equal to multiples of said maximum transverse dimensions of an assembled pair.

5. A package of chessmen, including:

(a) two sets of chessmen, each comprising eight pawns and eight pieces, each pawn and piece having side surfaces;

(b) a container internally shaped in the form of a rectangular parallelepiped;

wherein the improvement comprises:

(c) means at the upper ends of said chessmen defining sixteen pairs of complementary upper end surfaces, at least one pair of such surfaces having interfitting contours, so that the chessmen of each complementary pair may be assembled with their upper end surfaces in engagement and their axes aligned;

(d) each said assembled pair having portions of said side surfaces extending at right angles to the bottom surfaces of the pair and of substantial length, said portions of the side surfaces defining in each pair a region having equal maximum transverse dimensions in two directions perpendicular to each other and to the axis of the assembled pair;

(e) the corresponding regions in all the assembled pairs having equal maximum transverse dimensions;

(f) the sixteen pawns being adapted to be assembled in eight complementary pawn-pairs of equal length; and

(g) the sixteen pieces having axial dimensions proportioned with respect to the axial dimensions of the pawns so that the pieces may be assembled in eight complementary piece-pairs having a total length equal to a multiple of the length of one pawn-pair; and

(h) so that the two sets fit snugly into said container.

References Cited

UNITED STATES PATENTS

301,158	7/1884	Ravenscroft	273—137
430,915	6/1890	Buchheit.	
1,549,610	8/1925	Reisz	273—136

FOREIGN PATENTS

257,515	3/1913	Germany.
472,387	2/1929	Germany.
647,602	7/1937	Germany.
1,034,030	6/1966	Great Britain.

DELBERT B. LOWE, Primary Examiner

U.S. Cl. X.R.

206—46