

Description

The invention concerns a tool for use in the separation of elements in a building set as it is known by DE-A- 32 13 120. More particularly, it concerns a tool for use in the separation of elements in a building set of the type where the elements have a surface provided with coupling means in the form of projections or depressions.

When disassembling elements in a building set of the above-mentioned type it can often be a problem to separate the individual elements, in particular when they are low so that it is difficult to get a sufficiently good grip with the fingers. If individual elements are to be disassembled from a larger structure, it may moreover be difficult, if not impossible, to grip the elements without damaging other parts of the structure.

The object of the invention is accordingly to provide a tool which can be used for disassembling elements in a building set of the above-mentioned type so that the elements can easily be separated.

This object is achieved in that in one end of a lever the tool is provided with a gripper means for cooperation with a plurality of coupling means of the element and with one side edge of the element so that the element can be tilted loose by affecting the lever. The gripper means comprises a first jaw area which engages the side edge, while a second jaw area of the gripper means engages a portion of a wall part of the coupling means facing away from said side edge. When the lever is affected, the two jaw areas affect the element with a relatively great torque owing to their mutual horizontally as well as vertically displaced position, so that the element pivots around the lower boundary of the side edge.

The gripper means may be constructed in various ways, and, according to a preferred embodiment, it comprises at least one coupling means which is complementary to said coupling means and, in addition to increasing the friction between the gripper means and the element by tilting operations, also maintains the element in the gripper means after separation, so that the element can easily be moved out of large structures after separation.

The invention will be described more fully below with reference to the drawing, in which

fig. 1 is a sectional view of the use of a tool according to the invention for separation of two elements,

fig. 2 shows in more detail the structure of the gripper means of the tool in a preferred embodiment, and

fig. 3 shows a tool according to another embodiment.

Fig. 1 is a sectional view of two joined toy elements 1 and 2 which may sometimes be difficult

to separate, in particular for children. The surface of the toy elements is provided with coupling means in the form of coupling studs 4 and 5, while the underside is formed with a complementary recess 9. According to the invention, a tool 3 may be used for separating the elements 1 and 2. This tool comprises a gripper means in the form of a first jaw area 7 engaging the side edge of the building element 2, and a second jaw area 8 which engages a portion of a wall part of a coupling stud 5 facing away from the side edge. When the tool 3 is activated in the direction of the arrow, the element 2 is affected by a torque so as to be tilted out of engagement with the element 1, the element 2 tilting around the lower boundary of the side edge. Since the first jaw area engages the side of the element 2, this torque may be relatively great even when the engagement is effected on the side edge part disposed near the surface. It will be appreciated that a similar tool useful for separating elements from below may be manufactured according to the invention. Such a tool will likewise cooperate with the side face of the element, while a jaw area cooperates with a coupling means on the underside of the elements.

Fig. 2 shows a tool 11 according to a preferred embodiment of the invention, and this tool is intended for cooperation with the upper side of a building element. The tool 11 is provided with holes 15 which fit on coupling studs on an element. The tool moreover comprises a first jaw area in the form of a projecting part 12 with a face 13 which is intended to tightly engage the vertical side face of a building element when the coupling studs of the building element are received in the holes 15. In this embodiment, the second jaw area of the tool is formed by the part of the holes 15 which faces away from the projecting part 12. Since coupling studs on the building element will be coupled with the tool 11 by virtue of the holes 15, this embodiment has the advantage that the friction between the tool and the coupling means of the building elements is increased by the tilting operation, and also that the building element is retained in the tool after separation.

It has been found that the height of the wall 7 does not have to be very great for the moment transferred by the tool jaw areas to the building elements to be sufficient for separation, so that the tool may be used even in connection with entirely flat building elements.

Fig. 3 shows a tool 20 which can be used for separating elements from above as well as from below. For separating elements from above it has on the underside a first jaw area 21 intended to tightly engage the side edge of the element, and a second jaw area 22 cooperating with coupling studs on the upper side of the element. For separa-

tion of elements from below the tool 20 is on the upper side provided with a first jaw area 23 intended to tightly engage the side edge of the element, and a second jaw area, here in the form of two coupling studs 24 cooperating with the complementary coupling means on the underside of the element. It is evident to a skilled person that such a tool may be constructed in numerous ways. The two different gripping means, which are intended to separate elements from above and from below, respectively, can of course be placed arbitrarily with respect to each other, e.g. at their respective ends of the lever 25. The second jaw area 24 on the upper side of the tool 20 can of course have other forms than the shown one, if only the jaw area can tightly engage the complementary coupling means on the underside of the elements.

Claims

1. A tool for separating joined toy elements, **characterized** in that the tool comprises a lever (3) having a gripper means at least at one end, said gripper means having first and second engagement faces which face each other and are substantially perpendicular to a plane of force such that they can take up oppositely directed pressure forces which are parallel with the plane of force, and that one engagement face (8, 15, 22) is disposed at one side of the plane of force, while the other engagement face (7, 13, 21) extends a distance at the other side of the plane of force.
2. A tool according to claim 1, wherein the toy elements have a top face provided with coupling means (4, 5) which have a wall part extending transversely to the top face and which are preferably disposed in parallel with a side edge, **characterized** in that the other engagement face (7, 13, 21) is adapted to engage the side edge of the element (2), while said one engagement face (8, 15, 22) is adapted to engage a portion of the wall part of said coupling means (5) which faces away from said side edge, so that in the position of use said plane of force coincides with the top face of the toy element.
3. A tool according to claim 2, **characterized** by including a further engagement face (26) extending a distance outwardly from said other engagement face (13, 21) in alignment with said plane of force so that in the position of use the further engagement face engages a portion of the top face disposed near the side edge of the element.

4. A tool according to claim 3, **characterized** in that said opposed engagement faces define a cavity in the gripper means, said cavity having projections for frictional engagement with the coupling studs (fig. 2).
5. A tool according to any of the preceding claims, **characterized** in that the tool comprises gripper means at both ends of the lever.
6. A tool according to claim 1, wherein the toy elements have a bottom face which is provided with complementary coupling means in the form of depressions (6) extending transversely to the bottom face and preferably in parallel to the bottom face and preferably in parallel with a side of the element, **characterized** in that said other engagement face (23) is adapted to engage the side of the element, while said one engagement face (24) is adapted to engage the complementary coupling means, so that in the position of use said plane of force coincides with the bottom face of the element.
7. A tool according to claim 2, wherein the upper side of the elements is provided with coupling studs of the type having a central bore, **characterized** in that the gripper means comprises a plurality of projections extending in parallel with said other engagement face at such a distance from it that in the position of use the projections can be received in the bores when said other engagement face engages the side edge of the element.

Patentansprüche

1. Werkzeug zur Trennung verbundener Spielelemente, dadurch gekennzeichnet, daß das Werkzeug einen Hebel (3) mit Greifeinrichtung an wenigstens einem seiner Enden aufweist, wobei die Greifeinrichtung erste und zweite Eingriffsflächen aufweist, die einander gegenüberliegen und im wesentlichen senkrecht zu einer Kraftebene ausgerichtet sind, so daß sie entgegengerichtete Druckkräfte aufnehmen können, welche parallel zur Kraftebene sind, und daß die eine Eingriffsfläche (8, 15, 22) an der einen Seite der Kraftebene angeordnet ist, während die andere Eingriffsfläche (7, 13, 21) sich in einem Abstand an der anderen Seite der Kraftebene erstreckt.
2. Werkzeug nach Anspruch 1, dadurch gekennzeichnet, daß die Spielelemente eine obere Fläche aufweisen, die mit Kupplungseinrichtungen (4, 5) ausgebildet ist, welche einen Wandungsteil haben, der sich quer zur Oberfläche



tion of elements from below the tool 20 is on the upper side provided with a first jaw area 23 intended to tightly engage the side edge of the element, and a second jaw area, here in the form of two coupling studs 24 cooperating with the complementary coupling means on the underside of the element. It is evident to a skilled person that such a tool may be constructed in numerous ways. The two different gripping means, which are intended to separate elements from above and from below, respectively, can of course be placed arbitrarily with respect to each other, e.g. at their respective ends of the lever 25. The second jaw area 24 on the upper side of the tool 20 can of course have other forms than the shown one, if only the jaw area can tightly engage the complementary coupling means on the underside of the elements.

Claims

1. A tool for separating joined toy elements, characterized in that the tool comprises a lever (3) having a gripper means at least at one end, said gripper means having first and second engagement faces which face each other and are substantially perpendicular to a plane of force such that they can take up oppositely directed pressure forces which are parallel with the plane of force, and that one engagement face (8, 15, 22) is disposed at one side of the plane of force, while the other engagement face (7, 13, 21) extends a distance at the other side of the plane of force.
2. A tool according to claim 1, wherein the toy elements have a top face provided with coupling means (4, 5) which have a wall part extending transversely to the top face and which are preferably disposed in parallel with a side edge, characterized in that the other engagement face (7, 13, 21) is adapted to engage the side edge of the element (2), while said one engagement face (8, 15, 22) is adapted to engage a portion of the wall part of said coupling means (5) which faces away from said side edge, so that in the position of use said plane of force coincides with the top face of the toy element.
3. A tool according to claim 2, characterized by including a further engagement face (26) extending a distance outwardly from said other engagement face (13, 21) in alignment with said plane of force so that in the position of use the further engagement face engages a portion of the top face disposed near the side edge of the element.
4. A tool according to claim 3, characterized in that said opposed engagement faces define a cavity in the gripper means, said cavity having projections for frictional engagement with the coupling studs (fig. 2).
5. A tool according to any of the preceding claims, characterized in that the tool comprises gripper means at both ends of the lever.
6. A tool according to claim 1, wherein the toy elements have a bottom face which is provided with complementary coupling means in the form of depressions (6) extending transversely to the bottom face and preferably in parallel with a side of the element, characterized in that said other engagement face (23) is adapted to engage the side of the element, while said one engagement face (24) is adapted to engage the complementary coupling means, so that in the position of use said plane of force coincides with the bottom face of the element.
7. A tool according to claim 2, wherein the upper side of the elements is provided with coupling studs of the type having a central bore, characterized in that the gripper means comprises a plurality of projections extending in parallel with said other engagement face at such a distance from it that in the position of use the projections can be received in the bores when said other engagement face engages the side edge of the element.

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1. Werkzeug zur Trennung verbundener Spielzeuelemente, dadurch gekennzeichnet, daß das Werkzeug einen Hebel (3) mit Greifeinrichtung an wenigstens einem seiner Enden aufweist, wobei die Greifeinrichtung erste und zweite Eingriffsflächen aufweist, die einander gegenüberliegen und im wesentlichen senkrecht zu einer Kraftebene ausgerichtet sind, so daß sie entgegengerichtete Druckkräfte aufnehmen können, welche parallel zur Kraftebene sind, und daß die eine Eingriffsfläche (8, 15, 22) an der einen Seite der Kraftebene angeordnet ist, während die andere Eingriffsfläche (7, 13, 21) sich in einem Abstand an der anderen Seite der Kraftebene erstreckt.
2. Werkzeug nach Anspruch 1, dadurch gekennzeichnet, daß die Spielelemente eine obere Fläche aufweisen, die mit Kupplungseinrichtungen (4, 5) ausgebildet ist, welche einen Wandungsteil haben, der sich quer zur Oberfläche



erstreckt und welche vorzugsweise parallel mit einer Seitenkante ausgerichtet sind, dadurch gekennzeichnet, daß die andere Eingriffsfläche (7, 13, 21) so ausgebildet ist, daß sie mit der Seitenkante des Elementes (2) in Eingriff tritt, während die andere Eingriffsfläche (8, 15, 22) so ausgebildet ist, um mit einem Teil der Wandung der Kupplungseinrichtungen (5) in Eingriff treten, welcher von der Seitenkante wegweist, so daß in der Gebrauchslage die Kraftebene mit der Oberfläche des Spielzeuelementes zusammenfällt.

3. Werkzeug nach Anspruch 2, dadurch gekennzeichnet, daß eine weitere Eingriffsfläche (26) vorgesehen ist, die sich in einem Abstand außerhalb der anderen Eingriffsfläche (13, 21) in Ausrichtung mit der Kraftebene so angeordnet ist, daß in der Gebrauchslage die weitere Eingriffsfläche mit einem Teil der Oberfläche in Eingriff tritt, die in der Nähe der Seitenkante des Elementes angeordnet ist.
4. Werkzeug nach Anspruch 3, dadurch gekennzeichnet, daß die einander gegenüberliegenden Eingriffsflächen einen Hohlraum in der Greifeinrichtung bilden, wobei der Hohlraum Vorsprünge für den Reibeingriff mit den Kupplungszapfen (Figur 2) aufweist.
5. Werkzeug nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das Werkzeug Greifeinrichtungen an beiden Seiten des Hebels aufweist.
6. Werkzeug nach Anspruch 1, wobei die Spielzeuelemente eine Bodenfläche aufweisen, welche mit komplementären Kupplungseinrichtungen in der Form von Ausnehmungen (6) ausgebildet ist, die sich in Querrichtung zur Bodenfläche erstrecken und vorzugsweise parallel mit einer Seite des Elementes ausgerichtet sind, dadurch gekennzeichnet, daß die andere Eingriffsfläche (23) so ausgebildet ist, daß sie mit der Seite des Elementes in Eingriff tritt, während die andere Eingriffsfläche (24) so ausgebildet ist, daß sie mit den komplementären Kupplungseinrichtungen in Eingriff treten kann, so daß in der Gebrauchslage die Kraftebene mit der Bodenfläche des Elementes zusammenfällt.
7. Werkzeug nach Anspruch 2, wobei die obere Seite der Elemente mit Kupplungszapfen derjenigen Art ausgebildet sind, die eine zentrale Bohrung aufweist, dadurch gekennzeichnet, daß die Greifeinrichtung eine Mehrzahl von Vorsprüngen aufweist, die sich parallel zu der

anderen Eingriffsfläche in einem solchen Abstand von dieser erstrecken, daß in der Gebrauchslage die Vorsprünge in den Bohrungen aufgenommen werden, wenn die andere Eingriffsfläche mit der Seitenkante des Elements in Eingriff tritt.

Revendications

1. Outil pour séparer des éléments reliés formant jouet, caractérisé en ce que l'outil comporte un levier (3) ayant des moyens de saisie au moins au niveau d'une extrémité, lesdits moyens de saisie ayant une première et seconde faces de contact qui sont en vis à vis l'une de l'autre et sont perpendiculaires à un plan de force de telle sorte qu'elles peuvent supporter des forces de pression dirigées de manière opposées qui sont parallèles au plan de force, et qu'une première face de contact (8, 15, 22) est agencée au niveau d'un côté du plan de force, alors que l'autre face de contact (7, 13, 21) s'étend à distance au niveau de l'autre côté du plan de force.
2. Outil selon la revendication 1, dans lequel les éléments formant jouet ont une face supérieure munie de moyens de liaison (4, 5) qui ont une partie de paroi s'étendant transversalement à la face supérieure et qui sont de préférence agencés parallèlement à un bord latéral, caractérisé en ce que l'autre face de contact (7, 13, 21) est adaptée pour être en contact avec le bord latéral de l'élément (2), alors que ladite face de contact (8, 15, 22) est adaptée pour être en contact avec un tronçon de la partie de paroi desdits moyens de liaison (5) qui est dirigée s'éloignant dudit bord latéral, de telle sorte qu'en position d'utilisation ledit plan de force coïncide avec la face supérieure de l'élément formant jouet.
3. Outil selon la revendication 2, caractérisé en ce qu'il comporte une face de contact supplémentaire (26) s'étendant à distance vers l'extérieur de ladite autre face de contact (13, 21) en alignement avec ledit plan de force de telle sorte qu'en position d'utilisation la face de contact supplémentaire est en contact avec une partie de la face supérieure agencée à proximité du bord latéral de l'élément.
4. Outil selon la revendication 3, caractérisé en ce que lesdites faces de contact opposées définissent une cavité dans les moyens de saisie, ladite cavité ayant des saillies pour être en contact avec friction avec les tenons de liaison (figure 2).



5. Outil selon l'une quelconque des revendications précédentes, caractérisé en ce que l'outil comporte des moyens de saisie aux deux extrémités du levier.

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6. Outil selon la revendication 1, dans lequel les éléments formant jouet ont une face inférieure qui est munie de moyens de liaison complémentaires sous la forme d'une cavité (6) s'étendant transversalement par rapport à la face inférieure et de préférence parallèlement à un côté de l'élément, caractérisé en ce que ladite autre face de contact (23) est adaptée pour venir en contact avec le côté de l'élément, alors que ladite face de contact (24) est adaptée pour être en contact avec les moyens de liaison complémentaires, de telle sorte qu'en position d'utilisation ledit plan de force coïncide avec la face inférieure de l'élément.

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7. Outil selon la revendication 2, dans lequel le côté supérieur des éléments est muni de tenons de liaison du type comportant un alésage central, caractérisé en ce que les moyens de saisie comportent plusieurs saillies s'étendant parallèlement à ladite autre face de contact à une distance par rapport à celle-ci telle qu'en position d'utilisation les saillies peuvent être reçues dans les alésages lorsque ladite autre face de contact est en contact avec le bord latéral de l'élément.

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