

Aug. 9, 1966

W. P. DOE
WHEEL FOR TOY

3,264,780

Filed June 17, 1964

2 Sheets-Sheet 1

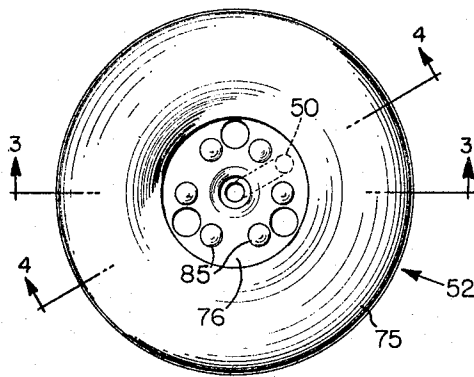


FIG. 1

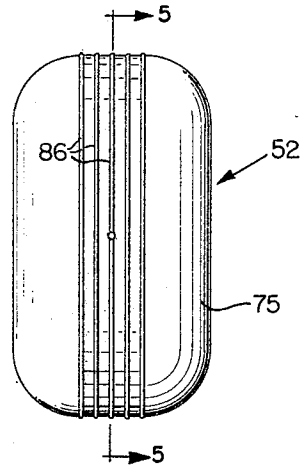


FIG. 2

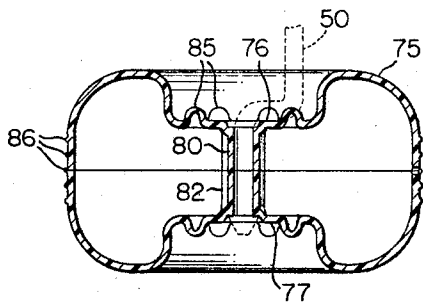


FIG. 3

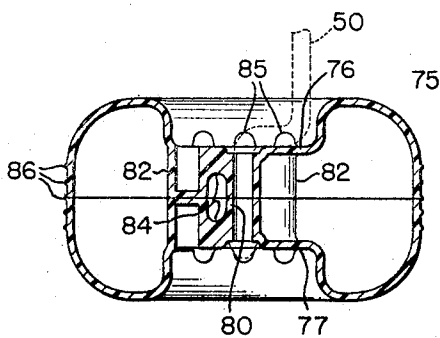


FIG. 4

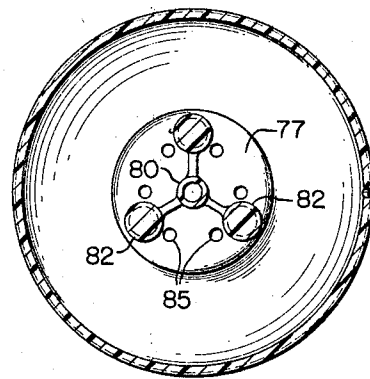


FIG. 5

INVENTOR
WALTER P. DOE

BY
Cumpton & Shaw
ATTORNEYS

Aug. 9, 1966

W. P. DOE
WHEEL FOR TOY

3,264,780

Filed June 17, 1964

2 Sheets-Sheet 2

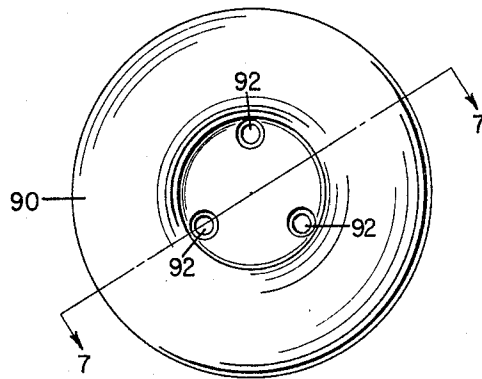


FIG. 6

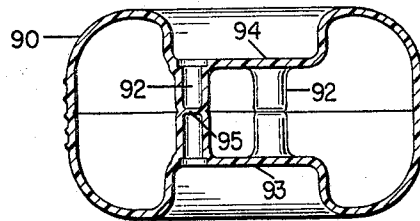


FIG. 7

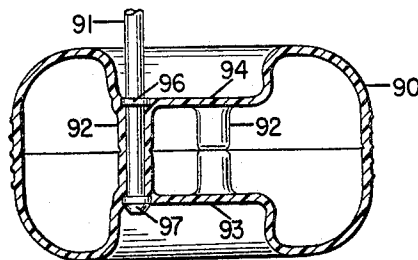


FIG. 8

INVENTOR.
WALTER P. DOE

BY

Cumpton & Shaw

HIS ATTORNEYS.

1

3,264,780

WHEEL FOR TOY

Walter P. Doe, East Aurora, N.Y., assignor to Fisher-Price Toys, Incorporated, East Aurora, N.Y., a corporation of New York

Filed June 17, 1964, Ser. No. 376,615

10 Claims. (Cl. 46—221)

The application is a continuation-in-part application of my copending parent application Serial No. 261,344 for Action Toy.

This invention relates to an improved wheel for a trundle or action toy, and more particularly to an improved plastic toy wheel that is molded in one piece.

An object of the invention is to mold in one piece as by blow molding, an attractive and functional toy wheel that is both functional and economical.

A related object of the invention is to provide a wheel of the character described that is inexpensive to construct, but unusually sturdy, resilient, and stable in its performance.

Another object of the invention is to provide hollow, high strength, lightweight, resilient wheels for trundle toys.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims. To these and other ends, the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of this specification.

In the drawings:

FIG. 1 is a side elevation of a wheel that is constructed in accordance with one preferred embodiment of this invention, and showing in dotted lines the position that would be occupied by the crank arm of a shaft on which the wheel is mounted;

FIG. 2 is a front elevation thereof;

FIG. 3 is a section taken on the line 3—3 of FIG. 1, looking in the direction of the arrows;

FIG. 4 is a section taken on the line 4—4 of FIG. 1, looking in the direction of the arrows;

FIG. 5 is a section taken on the line 5—5 of FIG. 2, looking in the direction of the arrows;

FIG. 6 is a side elevation of another preferred embodiment of a wheel according to the invention;

FIG. 7 is a section taken on the line 7—7 of FIG. 6 looking in the direction of the arrows; and

FIG. 8 is the cross section view of FIG. 7 showing eccentric mounting of the wheel on an axle.

Referring now particularly to FIGS. 1 through 5, one preferred embodiment of wheel 52 is illustrated. The numeral 75 denotes the toroidal-shaped body of the wheel. The body of the wheel and all of its parts are integral and are formed from a resilient, flexible, synthetic plastic material such as, for example, polyethylene.

The wheel 52 is formed with a pair of axially-spaced, radially-extending webs 76, 77, respectively, that are integral with the toroidal body 75 and that are disposed to extend between confronting inner wall portions or surfaces of the body, substantially in parallelism with each other. These webs are formed at their respective centers with aligned bores and with an integral, generally tubular hub-forming extension 80, whose bore is conjoint with the bores in the webs. This conjoint bore is proportioned snugly to receive therein the end of the crank arm 50, so that the extension 80 serves as a hub for the wheel.

The wheel is also formed with three axially-extending rigid members 82 that interconnect the webs with each other respectively and that are angularly spaced from each other about the hub 80. These rigid members are

2

preferably formed from axially-extending, opposed, generally tubular, integral extensions from the webs respectively, that have closed ends that are united with each other respectively, as shown in FIG. 8. Preferably, these wheels are formed by a blow molding process, and in this process, small webbed portions 84 are formed between the rigid members 82 and the hub 80, as shown in FIG. 8.

The webs are also formed with six axially-extending projections or bosses 85, that simulate the nuts that would fasten the wheel rim in place. The bosses 85 are proportioned and positioned to serve as stops, to resist any relative rotary movement between the crank arm 50 and the wheel 52, once the wheel has been mounted on the crank arm.

In FIGS. 6—8 is illustrated another preferred embodiment of a wheel 90 according to the invention. Wheel 52 shown in FIGS. 1—5 is especially suited for mounting on a crank arm 50 as described above. Of course, wheel 52 can also be mounted on a conventional straight axle for rotation concentric therewith. Wheel 90 of FIGS. 6—8 is adapted for eccentric mounting relative to a straight axle 91 and thus achieves eccentric motion for a trundle toy without resorting to the crank arm 50 described above. Of course, a crank arm or axle having another shape can also be used in association with wheel 90.

As best shown in FIG. 6, wheel 90 has no central bore or hub member. Hub 80 as described above is preferably formed in the same manner as rigid axial members 82 but can be omitted from a wheel such as wheel 90 which is intended for eccentric mounting.

Rigid members 92 are formed axially in wheel 90 in the same way that rigid members 82 were formed in wheel 52 as described above. Thus, rigid members 92 are formed by tubular extensions axially approaching each other from web portions 93 and 94 and meeting and secured to each other. The securing of such tubular extensions to each other to form rigid members 92 can be by welding or fusing the plastic material in an annular seam around each tubular member 92, but in the preferred blow molding of the wheel 90, such tubular extensions are joined by an integral disc of material 95 preferably axially centered relative to webs 93 and 94. By such construction, each rigid member 92 is hollow throughout its length except for the central disc of material 95. An axle 91, shown in FIG. 8 can be forced through any one of rigid members 92 by rupturing or forcing aside disc of material 95. The same procedure can be used for mounting an axle in hub 80 as shown in FIGS. 1—5. Thus, rigid members 92 and hub 80 are all interchangeable in function, each giving rigidity to the plastic wheel, and each providing a suitable housing for an axle.

Housing an axle in tubular members 92 or hub 80 provides a large bearing surface for the wheel and adds to the rolling life of the wheel. Axles may be housed either loosely or snugly in wheels 52 and 90, depending upon the function of the wheels relative to the trundle toy on which they are mounted. If no relative motion is desired between wheel and axle, bosses 96 and 97 can be formed on axle 91 as shown in FIG. 8 for compressing wheel 90. Bosses 96 and 97 are axially spaced closer together than the outer surfaces of webs 93 and 94 for providing an interference fit between wheel 90 and axle 91. The relative outside diameter of axle 91 and inside diameter of tubular member 92 can also contribute to a tight, interference fit. An alternative means for preventing relative rotation between wheel and axle would be to provide splines or other interlocking means between wheel and axle.

In making a wheel in accordance with this invention, blow molding techniques are preferred, but the wheel may be made in other ways. If blow molding techniques

are employed, two separate, allochiral mold halves, each of which can produce one-half of a wheel, are placed together and form a joint line, or mold parting line, that may be concealed by forming in the tire other circumferential lines 86, that simulate treads on a real tire. The center one of the circumferential lines 86 may coincide with and mask the joint line that is formed between the two wheel mold halves.

While the invention has been described herein by reference to the details of a preferred embodiment thereof, it is to be understood that such disclosure is intended in an illustrative rather than in a limiting sense, and it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. A unitary toy wheel that is made of synthetic plastic material and that has a generally toroidal body and a pair of axially-spaced, radially-extending webs that are integral with said body and that are disposed to extend between confronting inner wall surfaces of said wheel body, and a plurality of axially-extending rigid members that are integral with and interconnect said webs with each other.

2. A unitary wheel according to claim 1 wherein at least one of said rigid members is generally tubular and adapted to journal an axle.

3. A unitary toy wheel that is blow molded of a resilient, synthetic plastic material, and that has a generally toroidal body and a pair of axially-spaced, radially-extending webs that are integral with said body and that are disposed to extend between confronting inner wall surfaces of said body, hub means disposed centrally of said webs for receiving an axle therein, and a plurality of axially-extending rigid members that interconnect said webs with each other, said rigid members being formed of said plastic material and integral with said webs.

4. A wheel in accordance with claim 3 wherein said members are angularly spaced from each other about said hub, and said members and said hub means are formed of opposed, generally tubular extensions of each web respectively, the extensions from each web being disposed to engage respective opposite extensions from the other of said webs, and said opposed extensions being united where they engage, respectively.

5. A wheel according to claim 3 wherein outwardly

extending axial projections are formed radially about said hub and arranged for preventing rotation relative to said wheel of a crank arm on which said wheel may be mounted.

6. A unitary trundle toy wheel that is made of synthetic plastic material and has a generally toroidal-shaped body and a pair of axially-spaced radially-extending webs that are integral with the wheel body and that are disposed to extend between confronting inner wall surfaces of said wheel body, and a plurality of axially-extending rigid members that are integral with and interconnect said webs with each other, at least one of said rigid members being eccentric relative to said wheel and being generally tubular so as to receive and house an axle.

7. A wheel according to claim 6 adapted to be mounted on an axle and means on said wheel preventing rotation of said axle relative to said wheel.

8. A unitary wheel for a trundle toy that is blow molded of a resilient, flexible, synthetic plastic material and that has a generally toroidal-shaped body and a pair of axially-spaced, radially-extending webs that are integral with said body and that are disposed to extend between confronting inner wall surfaces of said wheel body, and a plurality of axially-extending rigid members that are integral with and interconnect said webs with each other and that are angularly spaced from each other.

9. A wheel in accordance with claim 8 wherein one of said rigid members is tubular and adapted to journal an axle.

10. A wheel in accordance with claim 8 wherein said rigid members are formed of opposed, generally tubular extensions of each web respectively, the extensions from each web being disposed to engage against the respective opposite extensions from the other web, and the opposed extensions being united where they engage, respectively.

References Cited by the Examiner

UNITED STATES PATENTS

2,242,915 5/1941 Kosi ----- 152-7

FOREIGN PATENTS

926,008 4/1947 France.

F. BARRY SHAY, *Primary Examiner*.

F. B. LEONARD, *Assistant Examiner*.