(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 055 354 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.05.2009 Bulletin 2009/19

(51) Int Cl.:
A63B 41/00 *(2006.01)*

(21) Application number: **08165592.0**

(22) Date of filing: **01.10.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(30) Priority: **09.10.2007 US 978469 P**
23.06.2008 US 178011

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(54) **Youth Oriented Sportsballs**

(57) Inflatable sportsballs such as volleyballs, soccer balls, basketballs, and footballs are disclosed having various volume/weight, surface area/weight, and or cover layer / carcass thickness ratios. Such sportsballs are particularly suitable for youth.

EP 2 055 354 A2

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from U.S. Provisional Patent Application Serial No. 60/978,469, filed October 9, 2007. That application is hereby fully incorporated by reference herein.

BACKGROUND

[0002] The present disclosure relates generally to youth-oriented inflatable sportsballs for competitive play. In particular, the sportsballs are meant to allow improved performance specific to a given age group during league play, competitive play, etc. Methods for making such sportsballs are also included.

[0003] Children are increasingly interested in various sports at a younger age. Although the industry has produced balls of various sizes, younger children also desire to play with inflatable sportsballs which are made for or used by older children or adults. However, such sportsballs may be unsuitable because they are more difficult to handle for younger children. They may also cause injury.

BRIEF DESCRIPTION

[0004] Disclosed, in various embodiments, are inflatable sportsballs for competitive play and methods for making such sportsballs.

[0005] In embodiments, a soccer ball may have a volume/weight ratio of 15.5 or greater. The volume/weight ratio may be from 15.5 to about 17.7.

[0006] The soccer ball may have a circumference of from about 59 cm to 66 cm.

[0007] In other embodiments, a soccer ball may have a surface area/weight ratio of 4.4 or greater. The surface area/weight ratio may be from 4.7 to about 5.4.

[0008] The soccer ball may have a circumference of from about 59 cm to 66 cm.

[0009] In other embodiments, a soccer ball may have a volume/weight ratio of 14.7 or greater and a surface area/weight ratio of 4.4 or greater.

[0010] In some embodiments, a basketball may have a volume/weight ratio of 14.4 or greater. The volume/weight ratio may be from 14.4 to about 15.7. The the volume/weight ratio may be from 14.4 to about 16.0.

[0011] The basketball may have a circumference of from about 69 cm to 74 cm.

[0012] In some embodiments, a basketball may have a surface area/weight ratio of 3.7 or greater. The surface area/weight ratio may be from 3.8 to about 4.2. The basketball may have a circumference af from about 69 cm to 74 cm.

[0013] In further embodiments, a basketball may have a volume/weight ratio of 13.9 or greater and a surface area/weight ratio of 3.8 or greater.

[0014] In some embodiments, a football may have a volume/weight ratio of 11.6 or greater. The volume/weight ratio may be from 12.1 to about 14.6.

[0015] In further embodiments, a football may have a volume/weight ratio of 11.0 or greater, a long axis circumference of from about 60 cm to 66 cm, and a short axis circumference of from about 44 cm to 47 cm.

[0016] In other embodiments, a football may have a surface area/weight ratio of 3.8 or greater. The surface area/weight ratio may be from 4.1 to about 5.1.

[0017] In some embodiments, a football may have a volume/weight ratio of 11.0 or greater and a surface area/weight ratio of 4.1 or greater.

[0018] In some embodiments, a volleyball may have a volume/weight ratio of 21.1 or greater. The volume/weight ratio may be from 21.1 to about 26.5. The volleyball may have a volume/weight ratio of 26.0 or greater.

[0019] In some embodiments, a volleyball may have a surface area/weight ratio of 6.0 or greater. The surface area /weight ratio may be from 6.1 to about 7.4.

[0020] In further embodiments, a sportsball comprises a cover layer and a carcass, wherein the ratio of the cover layer thickness to the carcass thickness may be 4.0 or greater. The ratio of the cover layer thickness to the carcass thickness may be from 4.0 to about 6.0. The sportsball may be spherical and have a circumference of from about 59 cm to about 76.2 cm.

[0021] These and other non-limiting characteristics are more particularly described below.

DETAILED DESCRIPTION

[0022] The present disclosure contemplates sportsballs having various combinations of volume/weight ratios and surface area/weight ratios. Such inflatable sportsballs include volleyballs, basketballs, soccer balls, and footballs.

[0023] The inflatable sportsball of the present disclosure may be a soccer ball. Several standards for soccer balls are shown in the following Table 1:

Table 1.

Standard	Minimum Circumference (cm)	Maximum Circumference (cm)	Minimum Weight (g)	Maximum Weight (g)
Size 3	59	60.5	290	310
Size 4	63.5	66	350	370
Size 5	68	70	405	430
NCAA	68.58	71.12	397.6	454.4
FIFA	68	70	410	450

[0024] In embodiments, the soccer ball of the present disclosure has a volume/weight ratio of 15.5 or greater. In specific embodiments, the soccer ball has a volume/weight ratio of from 15.5 to about 17.7. In further specific embodiments, the soccer ball has a circumference of from about 59 cm to 66 cm.

[0025] In other embodiments, the soccer ball of the present disclosure has a surface area/weight ratio of 4.4 or greater. In specific embodiments, the soccer ball has a surface area/weight ratio of from 4.7 to about 5.4. In further specific embodiments, the soccer ball has a circumference of from about 59 cm to 66 cm.

[0026] In additional embodiments, the soccer ball has a volume/weight ratio of 14.7 or greater and a surface area/weight ratio of 4.4 or greater.

[0027] The inflatable sportsball of the present disclosure may be a basketball. Several standards for basketballs are shown in the following Table 2:

Table 2.

Standard	Minimum Circumference (cm)	Maximum Circumference (cm)	Minimum Weight (g)	Maximum Weight (g)
Size 5	69	70	470	500
Size 6	72.4	73.7	530	550
Size 7	74.9	76.2	567	623
NBA	75.2	75.9	567	624
NCAA men's	74.9	76.2	567	624
NCAA women's	72.4	73.7	510	567
FIBA men's	74.9	78.0	567	650
FIBA women's	72.4	73.7	510	567

[0028] In embodiments, the basketball of the present disclosure has a volume/weight ratio of 14.4 or greater. In specific embodiments, the basketball has a volume/weight ratio of from 14.4 to about 15.7. In other specific embodiments, the basketball has a volume/weight ratio of from 14.4 to about 16.0. In further specific embodiments, the basketball has a circumference of from about 69 cm to 74 cm.

[0029] In other embodiments, the basketball of the present disclosure has a surface area/weight ratio of 3.7 or greater. In specific embodiments, the basketball has a surface area/weight ratio of from 3.8 to about 4.2. In further specific embodiments, the basketball has a circumference of from about 69 cm to 74 cm.

[0030] In additional embodiments, the basketball of the present disclosure has a volume/weight ratio of 13.9 or greater and a surface area/weight ratio of 3.8 or greater.

[0031] The inflatable sportsball of the present disclosure may be a football. Several standards for footballs are shown in the following Table 3:

Table 3.

Standard	Pee-Wee Football	Junior Size Football	Full Size Football	NCAA Football	CFL Football
Minimum Short Axis Circumference (cm)	44.5	47	52.7	52.7	53.0
Maximum Short Axis Circumference (cm)	46	48.3	54	54.0	53.7
Minimum Long Axis Circumference (cm)	60	64.6	70.8	70.5	70.5
Maximum Long Axis Circumference (cm)	61.5	65.9	72.9	71.8	71.8
Minimum Length (cm)	24	25.7	27.6	27.6	27.9
Maximum Length (cm)	25.5	26.7	29	28.4	28.6
Minimum Weight (g)	290	320	397	397	397
Maximum Weight (g)	320	350	425	425	425

[0032] The short axis may also be referred to as the girth. The length refers to the length of the long axis.

[0033] In embodiments, the football of the present disclosure has a volume/weight ratio of 11.6 or greater. In specific embodiments, the football has a volume/weight ratio of from 12.1 to about 14.6.

[0034] In other embodiments, the football of the present disclosure has a surface area/weight ratio of 3.8 or greater. In specific embodiments, the football has a surface area/weight ratio of from 4.1 to about 5.1.

[0035] In further specific embodiments, the football of the present disclosure has a volume/weight ratio of 11.6 or greater, a long axis circumference of from about 60 cm to 66 cm, and a short axis circumference of from about 44 cm to 47 cm.

[0036] In further specific embodiments, the football of the present disclosure has a circumference of from about 69 cm to 74 cm.

[0037] In additional embodiments, the football of the present disclosure has a volume/weight ratio of 11.0 or greater and a surface area/weight ratio of 4.1 or greater.

[0038] The inflatable sportsball, of the present disclosure may be a volleyball. Several standards for footballs are shown in the following Table 4:

Table 4

Standard	Minimum Circumference (cm)	Maximum Circumference (cm)	Minimum Weight (g)	Maximum Weight (g)
NCAA	65	67	260	280
FIVB	65	67	260	280
FIVB 12 and under	65	67	198	227

[0039] In embodiments, the volleyball of the present disclosure has a volume/weight ratio of 21.1 or greater. In specific

embodiments, the volleyball has a volume/weight ratio of from 21.1 to about 26.5.

[0040] In embodiments, the volleyball of the present disclosure has a volume/weight ratio of 26.0 or greater. In specific embodiments, the volleyball has a volume/weight ratio of from 26.0 to about 26.5.

[0041] In other embodiments, the volleyball of the present disclosure has a surface area/weight ratio of 6.0 or greater. In specific embodiments, the volleyball has a surface area/weight ratio of from 6.1 to about 7.4. In further embodiments, the volleyball has a surface area/weight ratio of 7.0 or greater.

[0042] The volume and surface area of the soccer ball, basketball, or volleyball may be calculated according to the general equations for spheres:

$$\text{Volume} = \frac{4}{3}\pi r^3$$

$$\text{Surface Area} = 4\pi r^2$$

where r is the radius.

[0043] The volume and surface area of the football may be calculated according to the general equations for prolate spheroids:

$$\text{Volume} = \frac{4}{3}\pi a^2 b$$

$$\text{Surface Area} = 2\pi\left[a^2 + \frac{abe}{\sin(e)}\right]$$

where a is the radius of the short axis, b is the radius of the long axis, and $e=\cos^{-1}\left(\frac{a}{b}\right)$. The radius of the short axis is one-half the length of the short axis, and the radius of the long axis is one-half the length of the long axis. Although a football is not exactly the shape of a prolate spheroid, the difference is not significant.

[0044] The sportsballs meeting the various requirements of the present disclosure are particularly suitable for younger children. The sportsballs are easier to handle, being of reduced weight, and reduce the risk of injury as well. However, the sportsballs can generally also meet the size requirements (i.e. circumference, length) of the various standards described above.

[0045] The sportsballs of the present disclosure are generally made according to known methods in the art. However, certain differences are evident. Cover material will be thinner. Winding layers may be thinner. Lighter weight or less dense materials may be used in the interior of the sportsballs or as cover materials. The bladder and carcass stock may also be thinner. Gases having a density lower than air may also be used to inflate the ball.

[0046] Sportsballs are generally made from a carcass which has a cover layer over it, the cover layer being formed from cover panels attached to the outer surface of the carcass. The outer surface of the carcass may have ribs projecting from it as well to define certain features, such as seams or channels on a basketball. The carcass itself may be formed from an inflatable bladder, a winding layer, and possibly some intermediate layers intended to enhance or reduce various properties of the sportsballs.

[0047] Cover panels generally have a thickness of from 0.5 to 3 millimeters. Bladdders generally have a thickness of from 0.5 to 3 millimeters. Winding layers generally have a thickness of from 0.5 to 3 millimeters. The intermediate layers may have a thickness of from 0.5 to 3 millimeters. Carcasses thus have a thickness of from 0.8 to 5.2 millimeters (ribs are not considered to be part of the carcass for purposes of this measurement).

The sportsball of the present disclosure may have a thinner carcass, such that the ratio of the cover layer thickness to the carcass thickness is 4.0 or greater. In further embodiments, the ratio of the cover layer thickness to the carcass thickness is from 4.0 to about 6.0.

The sportsballs and methods of the present disclosure have been described with reference to exemplary embodiments.

Obviously, modifications and alterations will occur to others upon reading and understanding the preceding detailed description. It is intended that the exemplary embodiments be construed as including all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

[0048] In addition to the attached claims, the invention may be defined by the following clauses:

1. A soccer ball having a volume/weight ratio of 15.5 or greater.

2. The soccer ball of clause 1, wherein the volume/weight ratio is from 15.5 to about 17.7.

3. The soccer ball of clause 1, wherein the soccer ball has a circumference of from about 59 cm to 66 cm.

4. A soccer ball having a surface area/weight ratio of 4.4 or greater.

5. The soccer ball of clause 4, wherein the surface area/weight ratio is from 4.7 to about 5.4.

6. The soccer ball of clause 4, wherein the soccer ball has a circumference of from about 59 cm to 66 cm.

7. A soccer ball having a volume/weight ratio of 14.7 or greater and a surface area/weight ratio of 4.4 or greater.

8. A basketball having a volume/weight ratio of 14.4 or greater.

9. The basketball of clause 8, wherein the volume/weight ratio is from 14.4 to about 15.7.

10. The basketball of clause 8, wherein the volume/weight ratio is from 14.4 to about 16.0.

11. The basketball of clause 8, wherein the basketball has a circumference of from about 69 cm to 74 cm.

12. A basketball having a surface area/weight ratio of 3.7 or greater.

13. The basketball of clause 12, wherein the surface area/weight ratio is from 3.8 to about 4.2.

14. The basketball of clause 12, wherein the basketball has a circumference of from about 69 cm to 74 cm.

15. A basketball having a volume/weight ratio of 13.9 or greater and a surface area/weight ratio of 3.8 or greater.

16. A football having a volume/weight ratio of 11.6 or greater.

17. The football of clause 16, wherein the volume/weight ratio is from 12.1 to about 14.6.

18. A football having a volume/weight ratio of 11.0 or greater, a long axis circumference of from about 60 cm to 66 cm, and a short axis circumference of from about 44 cm to 47 cm.

19. A football having a surface area/weight ratio of 3.8 or greater.

20. The football of clause 19, wherein the surface area/weight ratio is from 4.1 to about 5.1.

21. A football having a volume/weight ratio of 11.0 or greater and a surface area/weight ratio of 4.1 or greater.

22. A volleyball having a volume/weight ratio of 21.1 or greater.

23. The volleyball of clause 22, wherein the volume/weight ratio is from 21.1 to about 26.5.

24. The volleyball of clause 22, wherein the volleyball has a volume/weight ratio of 26.0 or greater.

25. The volleyball of clause 22, wherein the volleyball has a volume/weight ratio of from 26.0 to about 26.5.

26. The volleyball of clause 22, wherein the volleyball has a circumference of 65 to 67 cm.

27. A volleyball having a surface area/weight ratio of 6.0 or greater.

28. The volleyball of clause 27, wherein the surface area /weight ratio is from 6.1 to about 7.4.

29. A sportsball, comprising a cover layer and a carcass, wherein the ratio of the cover layer thickness to the carcass thickness is 4.0 or greater.

30. The sportsball of clause 29, wherein the ratio of the cover layer thickness to the carcass thickness is from 4.0 to about 6.0.

31. The sportsball of clause 29, wherein the sportsball is spherical and has a circumference of from about 59 cm to about 76.2 cm.

Claims

1. A soccer ball having a volume/weight ratio of 15.5 or greater.

2. A soccer ball having a surface area/weight ratio of 4.4 or greater.

3. A soccer ball having a volume/weight ratio of 14.7 or greater and a surface area/weight ratio of 4.4 or greater.

4. A basketball having a volume/weight ratio of 14.4 or greater.

5. A basketball having a surface area/weight ratio of 3.7 or greater.

6. A basketball having a volume/weight ratio of 13.9 or greater and a surface area/weight ratio of 3.8 or greater.

7. A football having a volume/weight ratio of 11.6 or greater.

8. A football having a volume/weight ratio of 11.0 or greater, a long axis circumference of from about 60 cm to 66 cm, and a short axis circumference of from about 44 cm to 47 cm.

9. A football having a surface area/weight ratio of 3.8 or greater.

10. A football having a volume/weight ratio of 11.0 or greater and a surface area/weight ratio of 4.1 or greater.

11. A volleyball having a volume/weight ratio of 21.1 or greater.

12. A volleyball having a surface area/weight ratio of 6.0 or greater.

13. A sportsball, comprising a cover layer and a carcass, wherein the ratio of the cover layer thickness to the carcass thickness is 4.0 or greater.

14. The sportsball of claim 13, wherein the ratio of the cover layer thickness to the carcass thickness is from 4.0 to about 6.0.

15. The sportsball of claim 13, wherein the sportsball is spherical and has a circumference of from about 59 cm to about 76.2 cm.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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