World Journal of Engineering and Technology, 2021, 9, 737-746
https://www.scirp.org/journal/wjet
ISSN Online: 2331-4249
ISSN Print: 2331-4222

Analysis on the Technical Standardization System of Juvenile Product in Europe and the United States of America and Strategies of Technical Measures of Trade

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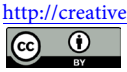
How to cite this paper: Huo, W.Q., Fang, H., Chen, X.T., Chen, Y., Tian, Y. and Chen, Z.G. (2021) Analysis on the Technical Standardization System of Juvenile Product in Europe and the United States of America and Strategies of Technical Measures of Trade. *World Journal of Engineering and Technology*, **9**, 737-746.
https://doi.org/10.4236/wjet.2021.94050

Received: April 12, 2021
Accepted: September 11, 2021
Published: September 14, 2021



Abstract

China is the largest country in the trade of juvenile products in the world. However, the products suffered the loss of technical barriers to trade from Europe and the United States of America increased year by year. This paper analyzes the standard system of juvenile products in Europe and the United States of America with the method of standard comparison, to find its relative technical advantages, explore the reasons for the recall notification of juvenile products exported to the above regions by China, propose strategies for breaking down the technical measures of trade, and promote the development of international juvenile product export trade.

Keywords

Technical Standardization System, Juvenile Product, Technical Measures of Trade

1. Introduction

International technical measures of trade become the primary means of trade protection in various countries because of their significant controlling effect and hidden implementation means [1]. Juvenile product is the international consumer goods with high sensitivity, whose quality and safety are related to the healthy development of children with great social attention. The standardization of the international juvenile product led by the European Union and the United States of America is very active, and a perfect and mature juvenile product stan-

dardization committee and Technical Standardization System have been established. China leads the world in the development of the juvenile product industry, but the standardization is still at the initial stage, and the standard system is still unformed. As a result, the technical indicators of domestic products are difficult to attain international standards, and the products exported to Europe and the United States of America (two most important export destinations of the Chinese juvenile product) are seriously recalled.

This paper compares and analyzes the Technical Standardization Systems of the juvenile product in Europe and the United States of America to find out the relative technology gap and comparative advantages and explore the situation of the recall of the juvenile product exported to Europe and the United States of America in recent years, thereby analyzing the reasons and proposing relevant strategies of technical measures of trade.

2. Research on Technical Standardization System

2.1. Europe

The standardization of the juvenile product in the EU region is formulated by CEN/TC 252 "Child care articles" Technical Committee. The responsibilities of CEN/TC 252 standardization committee include developing standards for product safety requirements in child use and care articles industry. Such products include all designed or obviously intended to safely ensure and facilitate seating, bathing, changing and general body care, feeding, sleeping, transportation and protection for young children [2]. They are included in the following 7 working groups, and the organizational framework of CEN/TC 252 is shown in **Figure 1**.

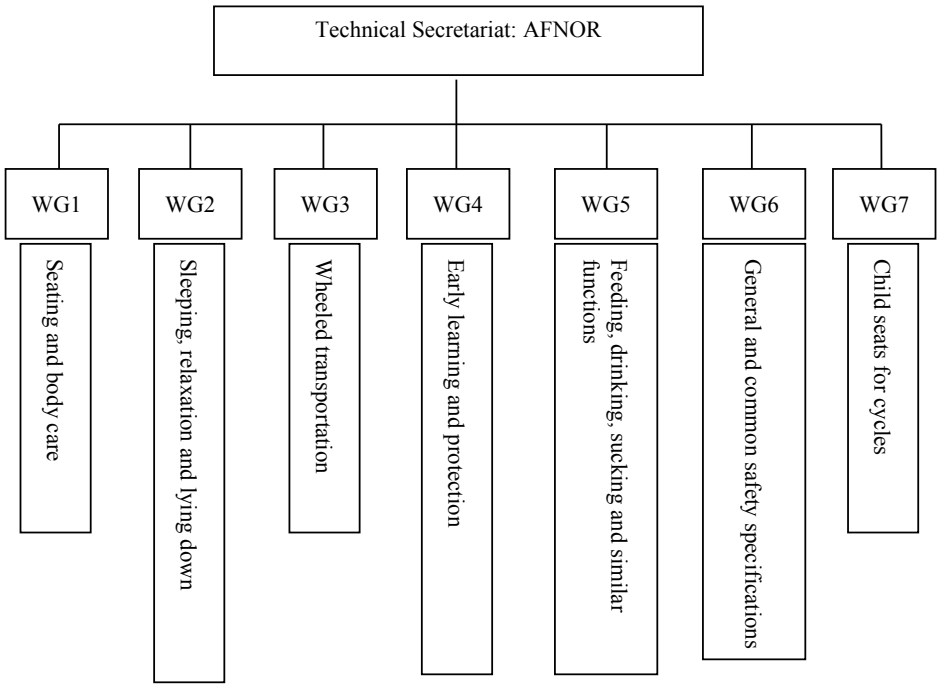


Figure 1. Organizational framework of CEN/TC 252 standard system.

According to the research directions of these 7 standards, CEN/TC 252 has developed 31 EU standards, as shown in Table 1 below.

Table 1. Developing list of the CEN/TC 252 standard.

WG	Standard Number	Title
Seating and body care	EN 17022:2018	Child care articles—Bathing aids—Safety requirements and test methods
	EN 17072:2018	Child care articles—Bathtubs, stands and non-standalone bathing aids—Safety requirements and test methods
	EN 1272:2017	Child care articles—Table mounted chairs—Safety requirements and test methods
	EN 16232:2013+A1:2018	Child use and care articles—Infant swings
	EN 1273:2005	Child use and care articles—Baby walking frames—Safety requirements and test methods
Sleeping, relaxation and lying down	EN 12221-1:2008+A1:2013	Child use and care articles—Changing units for domestic use—Part 1: Safety requirements
	EN 12221-2:2008+A1:2013	Child use and care articles—Changing units for domestic use—Part 2: Test methods
	EN 1466:2014/AC:2015	Child use and care articles—Carrycots and stands—Safety requirements and test methods
	EN 12790:2009	Child use and care articles—Reclined cradles
	EN 14036:2003	Child use and care articles—Baby bouncers—Safety requirements and test methods
Wheeled transportation	EN 14344:2004	Child use and care articles—Child seats for cycles—Safety requirements and test methods
	EN 13209-2:2015	Child use and care articles—Baby carriers—Safety requirements and test methods—Part 2: Soft carrier
	EN 1888-1:2018	Child care articles—Wheeled child conveyances—Part 1: Pushchairs and prams
	EN 1888-2:2018	Child care articles—Wheeled child conveyances—Part 2: Pushchairs for children above 15 kg up to 22 kg
Early learning and protection	EN 13209-1:2004	Child use and care articles—Baby carriers—Safety requirements and test methods—Part 1: Framed back carriers
	EN 14350-2:2004	Child use and care articles—Drinking equipment—Part 2: Chemical requirements and tests
	EN 1930:2011	Child use and care articles—Safety barriers—Safety requirements and test methods
	EN 13210:2004	Child use and care articles—Children's harnesses, reins and similar type articles—Safety requirements and test methods
	CEN/TR 16512:2015	Child use and care articles—Guidelines for the safety of children's slings

Continued

Feeding, drinking, sucking and similar functions	EN 14350-1:2004	Child use and care articles—Drinking equipment—Part 1: General and mechanical requirements and tests
	EN 1400:2013+A2:2018	Child use and care articles—Soothers for babies and young children—Safety requirements and test methods
	EN 12868:2017	Child use and care articles—Method for determining the release of N-nitrosamines and N-nitrosatable substances from elastomer or rubber teats and soothers
	EN 14372:2004	Child use and care articles—Cutlery and feeding utensils—Safety requirements and tests
	EN 12586:2007+A1:2011	Child use and care articles—Soother holder—Safety requirements and test methods
General and common safety specifications	CEN/TR 13387-2:2018	Child care articles—General safety guidelines—Part 2: Chemical hazards
	CEN/TR 13387-5:2018	Child care articles—General safety guidelines—Part 5: Product information
	CEN/TR 13387-3:2018	Child care articles—General safety guidelines—Part 3: Mechanical hazards
	CEN/TR 16411:2019	Child care articles—Compiled interpretations of CEN/TC 252 standards
	CEN/TR 13387-4:2015	Child use and care articles—General safety guidelines—Part 4: Thermal hazards
	CEN/TR 13387-1:2018	Child care articles—General safety guidelines—Part 1: Safety philosophy and safety assessment
Child seats for cycles	EN 16120:2012+A2:2016	Child use and care articles—Chair mounted seat

It can be seen from the standard system and standard list that CEN/TC 252 standard system is around two aspects of "general basis and safety of general products" and "safety of specific products", and focuses on the study of user behavior and physiological characteristics of infants and children to develop "General safety guidelines—Part 1: Safety philosophy and safety assessment" and other standards for child injury risk assessment, risk safety guidelines, risk prevention and control, and the items of standard account for 16% of the total. This part of the standards provides the research basis and guidance for the development of specific product safety standards. This is also the key reason that the technical committee is leading the world in standard development technology.

2.2. The United States of America

As the biggest international juvenile product market, the United States of America has mature juvenile Technical Standardization System, and Consumer Product Safety Commission (CPSC) and American Society for Testing and Materials (ASTM) jointly develop voluntary product standards, and take part of voluntary standards as mandatory regulations in order to realize the supervision of consumer goods in circulation. F15 "Consumer Products" technical committee of ASTM is responsible for juvenile product standards of the United States of America [3]. The technical committee has formulated consumer safety and performance criteria including specifications, guidelines, test methods, classifica-

tion, application and terminology. It has 15 sub technical committees for the juvenile product, which can be classified into 6 product standard systems: wheel bearing and crib, recreation facilities, auxiliary seat, General and common specifications, feeding, clothing. The framework of ASTM F15 standard system for juvenile product is shown in Figure 2, and in Table 2 is for the standard list.

Table 2. ASTM juvenile product standard list of the United States of America.

Sub technical committees	Standard Number	Title
Wheel bearing and crib	ASTM F833-19	Standard Consumer Safety Performance Specification for Carriages and Strollers
	ASTM F977-18	Standard Consumer Safety Specification for Infant Walkers
	ASTM F2012-18e1	Standard Consumer Safety Performance Specification for Stationary Activity Centers
	ASTM F406-19	Standard Consumer Safety Specification for Non-Full-Size Baby Cribs/Play Yards
	ASTM F1169-19	Standard Consumer Safety Specification for Full-Size Baby Cribs
	ASTM F1821-19e1	Standard Consumer Safety Specification for Toddler Beds
	ASTM F2194-16e1	Standard Consumer Safety Specification for Bassinets and Cradles
	ASTM F2388-18	Standard Consumer Safety Specification for Baby Changing Products for Domestic Use
	ASTM F2906-13(2019)	Standard Consumer Safety Specification for Bedside Sleepers
	ASTM F3084-18	Standard Consumer Safety Specification for Infant and Infant/Toddler Rockers
	ASTM F3118-17a	Standard Consumer Safety Specification for Infant Inclined Sleep Products
	ASTM F2050-19	Standard Consumer Safety Specification for Hand-Held Infant Carriers
	ASTM F2088-19	Standard Consumer Safety Specification for Infant Swings
	ASTM F2167-19	Standard Consumer Safety Specification for Infant Bouncer Seats
	ASTM F2236-16a	Standard Consumer Safety Specification for Soft Infant and Toddler Carriers
	ASTM F2549-14a	Standard Consumer Safety Specification for Frame Child Carriers
	ASTM F2907-19	Standard Consumer Safety Specification for Sling Carriers
	ASTM F2264-14(2019)	Standard Consumer Safety Specification for Non-Powered Scooters
Recreation facilities	ASTM F1917-12	Standard Consumer Safety Performance Specification for Infant Bedding and Related Accessories
	ASTM F1838-19	Standard Performance Requirements for Adult and Children's Plastic Chairs for Outdoor Use
	ASTM F1858-98(2014)	Standard Performance Requirements for Multipositional Plastic Chairs with Adjustable Backs or Reclining Mechanisms for Outdoor Use
	ASTM F1988-99(2014)	Standard Performance Requirements for Plastic Chaise Lounges, With or Without Moving Arms, With Adjustable Backs, for Outdoor Use
	ASTM F1148-18	Standard Consumer Safety Performance Specification for Home Playground Equipment

Continued

Auxiliary seat	ASTM F1967-19	Standard Consumer Safety Specification for Infant Bath Seats
	ASTM F2670-18	Standard Consumer Safety Specification for Infant Bath Tubs
	ASTM F3343-19a	Standard Consumer Safety Specification for Infant Bathers
	ASTM F404-18a	Standard Consumer Safety Specification for High Chairs
	ASTM F1004-19	Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures
	ASTM F1235-18	Standard Consumer Safety Specification for Portable Hook-On Chairs
	ASTM F2640-18	Standard Consumer Safety Specification for Booster Seats
	ASTM F3317-18a	Standard Consumer Safety Specification for Infant Floor Seats
	ASTM F2613-19	Standard Consumer Safety Specification for Children's Chairs and Stools
General and common Specification	ASTM F2951-19	Standard Consumer Safety Specification for Baby Monitors
Feeding	16 CFR Part 1511	Requirement for pacifiers
Clothing	ASTM F1816-18	Standard Safety Specification for Drawstrings on Children's Upper Outerwear

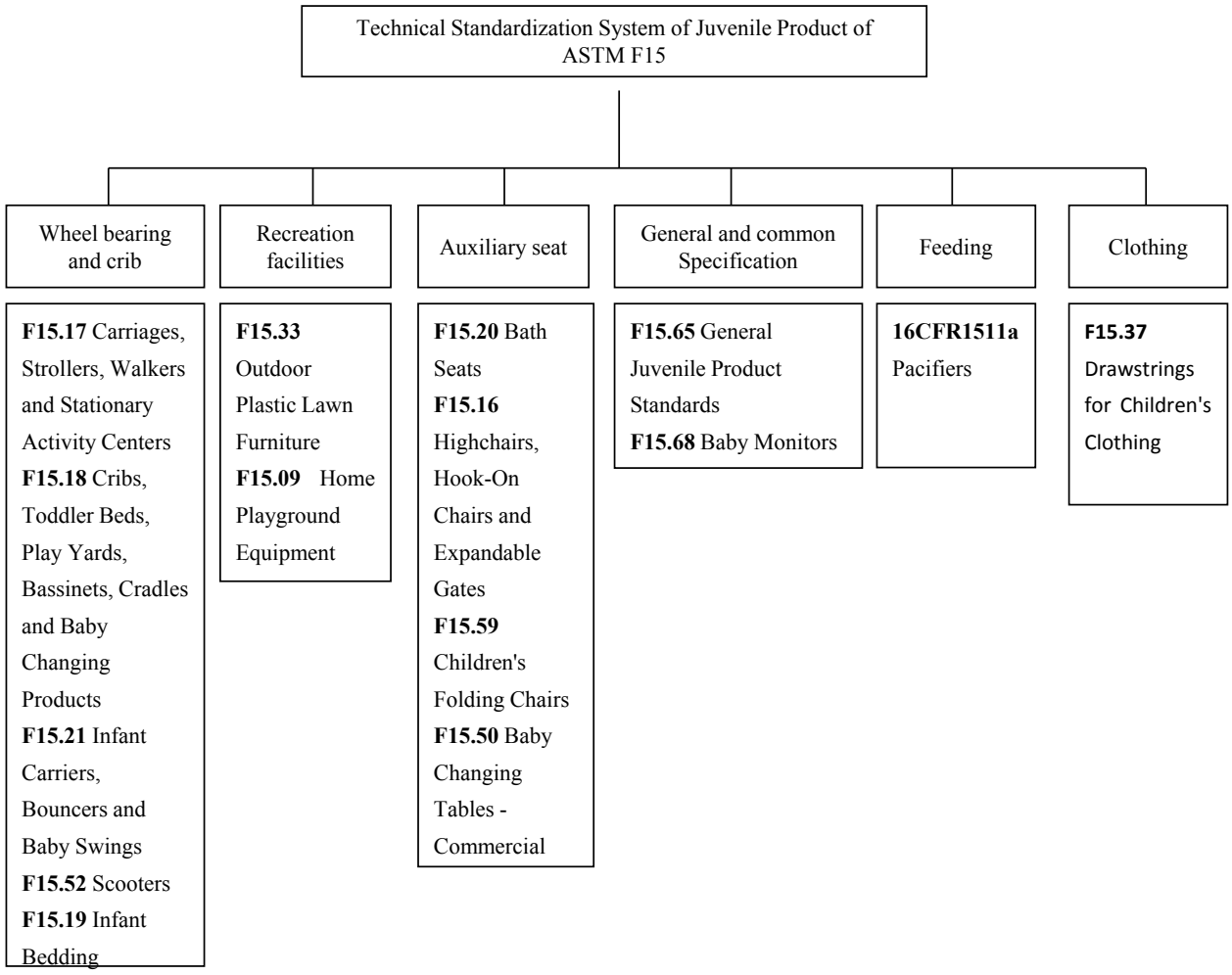


Figure 2. Juvenile product standard system of the United States of America.

In the United States of America, the technical regulations related to children's products are more dispersed, including the written bill made by Congress, the rules, requirements and specifications made by federal government departments, and relevant regulations related to children's products made by the states. The Consumer Product Safety Improvement Act (CPSIA/HR4040), which came into effect in 2008, has been revised based on the Consumer Product Safety Act. It formulated more rigorous safety standards and safety requirements for children's products (children's products, clothing, etc.), and further severely punished violations of product quality and safety regulations. The bill also requires to establish consumer product safety bulletin data, and manufacturers must affix permanently clear and striking standards on their products and packaging to facilitate consumers to identify and determine the manufacturer's name, production date, place of origin and other relevant production information to ensure the traceability of production.

3. Product Recall and Cause Analysis

3.1. Europe

As important and sensitive export trade goods in China, juvenile product frequently becomes the focus of trade frictions. The EU is the largest export area of juvenile product in China, but China never provides any basic research data when dealing with the implementation of technical trade barriers of developed countries in Europe to the Chinese export juvenile product, which leads to a passive position in the international response. The recall of juvenile product issued by EU through Rapid Alert System for Non-food Consumer Products (RAPEX) in 2011-2020 is shown in Figure 3, and it's revealed that China had always been the most seriously affected by the recall for all time, which has caused severe economic losses to Chinese export of juvenile product, and also badly affected the reputation of Chinese export products [4].

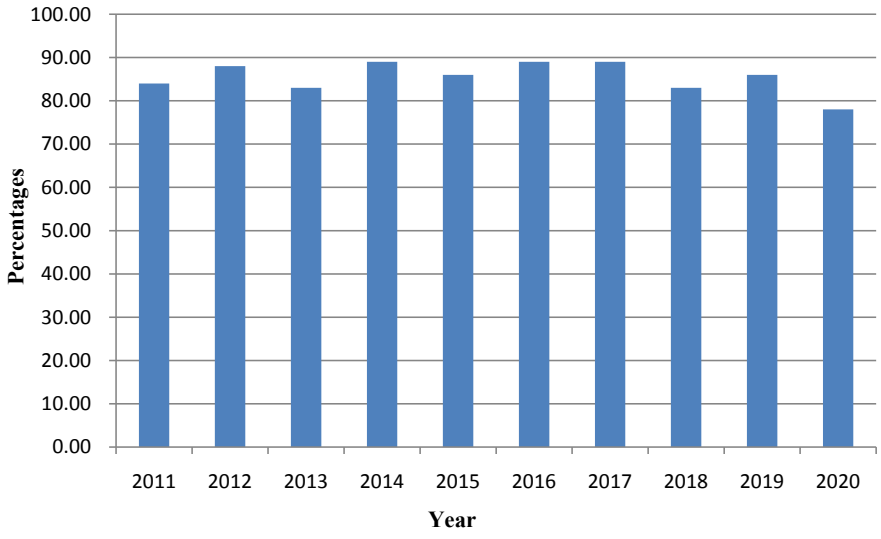


Figure 3. Percentages of RAPEX recall cases of China juvenile product in 2011-2020.

From 2016 to 2020, there were about 30 kinds of recall of Chinese juvenile product involved in EU non-compliance standards or regulations, among which 19 cases did not mention any standards or regulations, mainly including 14 times of EN 12586, 12 times of EN 14988, 11 times of EN 1888 and REACH regulation, 9 times of EN 1930, 6 times of EN 8098 and EN 1273. The main reasons for the blocked recall of the juvenile product in China focus largely on mechanical and physical safety and chemical safety, among which the mechanical and physical safety mainly involves: instability problem, failure of constraint system, injury caused by gap/hole/opening or protruding/sharp part, widget flaking off and long drawstring; chemical safety mainly involves the following chemicals: phthalate DEHP, short-chain chlorinated paraffins (SCCPs), flame retardants TCEP and TCPP. The EU directives 2009/48/EC and 76/769/EEC, POP, REACH regulation and EN 71 series standards, all present requirements on chemical safety of juvenile product [5].

3.2. The United States of America

The United States of America is an important importer of Chinese juvenile product. Customs statistics show Chinese exports of juvenile product to the United States of America was $8.57 billion, accounting for 25.59% of the total export of juvenile product in 2020 [6]. The United States of America sets up a strict technical regulation system on the quality and safety of children's products with complex and numerous provisions. At different times, the United States of America Congress supplements the original technical regulations through amendments according to public reflection and political needs.

The United States of America is an important importer of Chinese juvenile product [7]. Moreover, the United States of America sets up a strict technical regulation system on the quality and safety of children's products with complex and numerous provisions. At different times, the United States of America Congress supplements the original technical regulations through amendments according to public reflection and political needs. In 2020, the CPSC of the United States of America released a total of 257 recall notifications, with 135 consumer goods from China, including 21 cases of juvenile product, ranking second in the category of recalled products in China (see **Figure 4**).

Among the multiple types of injuries in the recall cases in the United States of America, choking (34.4%), falling (13.1%) and burn (10.6%) are the most frequent types of injuries, and the main products causing the three kinds of injuries are children's furniture and clothing. The falling injuries caused by children's furniture (46.8%) breaches the requirements of Code of Federal Regulations 16 CFR 1219, 1220 and 1222 for the support system and warning label of crib, 16 CFR 1218 for the stability, constraint system and height of baby basket, 16 CFR 1224 for provisions the space of portable bed rail and other provisions for protection in the event of falling; Burn injuries caused by children's clothing (71.1%) breaches flammability standards for garment textile production of Code of Federal Regulations 16 CFR 1610 and tougher flammability requirements for children's pajamas (16 CFR 1615, 1616).

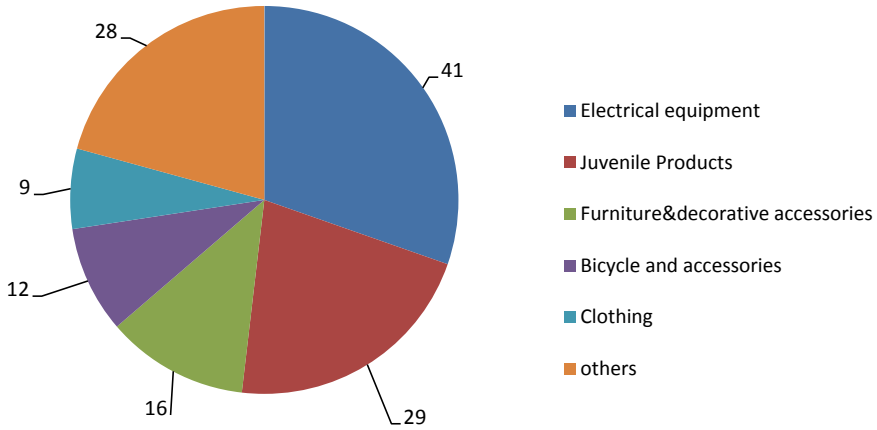


Figure 4. Statistics of recall of Chinese juvenile product by CPSC in 2019.

4. Conclusions: Strategies of Technical Measures and Responses of Trade

1) Because the children are curious and naughty, but fragile and vulnerable, Europe and America developed a very strict standard system for the juvenile product with wide coverage. From information collection and notification during product usage and sales to the safe consumption demand of widgets on children's clothing, the technical indicators are constantly updated with the improvement of actual requirements. The relevant exporters should learn carefully the standard system of export target market, pay close attention to the introduction and update of technical measures of trade, actively adopt international advanced standards or formulate higher enterprise standards, and fully consider the safety performance of the juvenile product in the phase of product design and development to lead the quality market of the juvenile product.

2) As for the unreasonable technical measures of trade, the juvenile product exporters should timely cooperate with the government agencies and industry associations to scope reviews for the full exercise of initiative, thereby having the opportunity to delay, reduce and even eliminate the economic losses caused by the technical measures of trade formulated by other WTO members to the foreign trade of Chinese juvenile product industry, and escort the export of the juvenile product. At present, China has established Shantou toys, Hangzhou baby and child products, Yunhe wooden toys, Ninghai stationery, Cixi buggies and child car seats, and other review bases of technical measures of trade, which provide a good platform for enterprises to participate in report review.

3) Focus on avoiding the risk of a product recall. From 2011 to 2019, the high-risk recalled products of Chinese children's products exported to the United States of America were children's strollers and cribs. The types of injuries were focusing on choking caused by toys, falling caused by children's furniture, and burn caused by children's clothing, and the refund was always taken as the primary remedial measure. Therefore, we should focus on the risk of a product recall, assist enterprises to track the recent recall of similar exported products of

the enterprise by CPSC recall system, pay attention to the main authorization of CPSC supervision on all kinds of products (for example, children's clothing focuses on the flammability), and rectify the high-risk quality and safety projects to avoid the loss of similar product export recall.

4) Accelerate the improvement of the standardization mechanism and standard system construction of the juvenile product in China. The standard system of the juvenile product in China is more dispersed with a large number but low level. Currently, there are no legal regulations and standards for the juvenile product, and the specification of this area is to formulate special product standards based on the framework of general legal regulations. Therefore, we should closely follow the development trend of quality and safety factors of juvenile product and technical measures of trade of main export target markets, accelerate the development of corresponding mandatory national standards, simplify and integrate current standards, eliminate cross-industry and cross-regional technical differences, and establish a fully covered, high-level and high-quality national standard system for the juvenile product.

Acknowledgements

The authors are grateful for the support of the research projects of General Administration of Customs of China (No.2020HK104).

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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