ENTR 408 – Final Report
Name: Chia Wen CHENG
U-M ID: 69949750

1. Section I: Invention Disclosure

a. Title: Plastic Cup Lid Rotatable/PP swiveling cover (from several online stores at Alibaba, Guangzhou jingsui plastic products Co., Ltd., etc.)

b. Inventors: not known

c. List the dates for the following events (If known):

i. First Record of Invention (conception – idea and/or sketch): not known

ii. Date of Working Model and first test/use: not known

iii. Date of First Internal / External Disclosures: not known

iv. Date of sale or first offer for sale: not known but no later than the year 2022

d. Description of the Invention:

i. Purpose / Problem Solved:

The previous plastic milk tea cup lid either has a small hole that allows customers to insert one straw at a time, and will stay open once used, or has a hole that allows customers to sip directly from the hole, and needs a stopper to keep it closed. Some improvements of closing the opening after opened have been promoted, but they are still difficult to enjoy cheese foam on the top of the beverage. This cup lid with rotatable cover allows customers to enjoy cheese foam and the toppings in the bottom such as bubble, pudding, grass jelly, taro balls, and coconut jelly, at the same time.

ii. How does the invention work:

A 13mm hole with an easy-to-break cover from its edge on the face of the cup lid is where a large straw or a small straw can be inserted. It is non-reversable, so once used, it will stay open unless an external stopper is applied. A rotatable fan-shaped cover above the cup lid and is sticked to the lid at the center of it encloses a large hole on the same surface of the cup lid at position 1. When moved to position 2, the large hole is totally open and it is large enough for a person's lips to fully put on it to sip contained drink. When rotating, the straw will not stick the way of the cover. The cover will not run into the straw, either.

iii. Are there design alternatives?

Yes, the rotatable fan-shaped piece can be sticked on the bottom surface of the cup lid instead of the top. It can also be designed to flip instead of rotating.

iv. List any known competitors, and differences over prior art:

- conventional coffee cup lids with a small hole that needs external stopper; and/or
- plastic cup lids with a switchable arm right above or below the lid (still on it) that covers the hole on the lid at position 1 and open it at position 2; and/or
- plastic cup lids with a movable arm based on the lid and can reach the external area of the lid that covers the hole on the lid at position 1 and open it at position 2;

- one main difference is that there are two holes, one small and round for straws and the other large and fan-shaped for mouth, on the invented lid, while there is only one hole for either straws or mouths on prior arts; and
- differences also include that the cover is added to the lid comparing to the first competitors; and the cover is placed above the lid so it does not require another arm or design to move it around comparing to the second competitors.

v. Drawings or Sketches:

2. Section II: Searching

a. Describe your search strategy:

I first used Google to search for the possible names of the item I was looking for in the market. “Plastic cup lid rotatable” and “PP swiveling cover” were the ones found. I copied the names as strings of keywords to search in Google Patents. And then I identified a classification, which was B65D, using the U.S. Patent and Trademark Office, and did additional classification and key word searching.

b. Databases searched: Google Patents

c. List of search strings (keywords, classifications, any assignees searched):

i. Keywords: plastic cup lid rotatable (more than 100,000 results)

ii. Keywords: pp swiveling cover (more than 100,000 results)

iii. Keywords: B65D; cup lid; plastic (32,054 results)

iv. Keywords: swiveling cover; B65D; milk tea (910 results)

d. List the 2 closest prior art references (include at least one patent):

i. Reference 1: US8807371B2 (DRINKING CUPLID HAVING RECESSED OPENING AND SEALNG PLUG invented by Daniel J. Zuares, Rockville, MD (US); Robert M. Schwartz, Miami, FL (US); Tony Licari, Davie, FL (US))

ii. Reference 2: US7721911B2 (ROTATING TYPE CUPLID invented by Bob Chou,963 N. Fletcher Ave., Valley Stream, NY (US) 11580)

3. **Section III: Patentability** – For each of the search results: provide a brief summary of the reference, identify any features in your invention that are not included or are different than the reference, and indicate whether your invention is patentable over the reference. Attach pdf's to the email submission.
    a. Reference 1:
        i. Brief summary: this referenced cup lid comprises an upper and a bottom face with an opening typically for the contained liquid to come out and allows a large or a small straw to get in, and a plug supported by two arms that are rotatable or flippable and can open and close the opening.
        ii. Features and differences: a second hole for use—sipping cheese foam, exists in the invention, which is a feature not included in this reference; this reference has a second small hole for the hot steam to come out so that the cup body and the lid will not be expanded; a plug and support arms are not found in the invention, either; this novel improvement is different from the patented article and patentable under 35 U.S.C. §101, thus, it is patentable over this reference.
    b. Reference 2:
        i. Brief summary: this reference cup lid comprises an upper and a bottom face with three openings typically for the contained liquid to come out and some allow a large or a small straw to get in, a circular groove without an opening, and a rotatable protruding knob that can open and close the openings.
        ii. Features and differences: a larger non-circular hole exists in our invention, which is not in this reference, while three other small circular holes do not appear in the invention; this feature is important because it benefits cheese foam lovers; the rotatable body at the center of the reference cup lid is not seen in the invention, either; instead, a switchable cover piece exists, which allows multiple holes to be used at the same time for the convenience of use; the novel invention is different from the patented article and patentable under 35 U.S.C. §101; thus, it is patentable over this reference.

4. **Section IV: Non-infringement**
    a. Fill out a claim chart below for <u>one independent claim</u> from <u>only one reference</u> (add rows as needed for claim elements):

Independent claim (insert claim, limitation-by-limitation, quoted exactly from reference below)	Corresponding Element in Invention
US7721911B2: A rotating type cup lid, mounted on a cup opening of a cup body, for selectively	The invention is a rotating type cup lid that mounts on an opening of a cup body, can open and close the opening, and can be used

turning open and close the cup opening or providing a use with a large straw or a small straw, and the rotating type cup lid comprising:	with a large straw or a small straw.
a) a cover having a cover portion, a wall surface disposed around of the cover portion, and a flange connecting surface extended from a bottom edge of the wall surface, a center of the cover portion having a protruded first circular groove, an internal side of the first circular groove having a central circular hole and an external side of the first circular groove with a first through hole, a middle section of the wall surface having an inwardly concaved first latch portion, the cover portion of the cover further includes a plurality of first ribs radiating in different paths from a center of the cover portion and at least one concentric circular rib disposed between the first ribs; and	The invention has a cover portion, a wall surface disposed around of the cover portion, and a flange connecting surface extended from a bottom edge of the wall surface. It has a circular groove but without a central circular hole and an external side through hole.
b) a rotating body disposed corresponding to a cover portion of the cover and having a second circular groove with a rotating surface corresponding to the rotating surface of the first circular groove, a protruding knob being passed through the central circular hole, a downwardly tapered edge being formed at a	The invention has neither second circular groove nor a protruding knob.

periphery of the rotating body that is embeddable into an internal surface of the first latch portion of the cover, such that the rotating body is positioned at an upper half position of an internal edge of the cover, the rotating surface of the rotating body includes a plurality of second ribs radiating in different paths, such that when the second ribs are rotated to be in respective correspondence with the bottom of the first ribs, the second ribs are engaged and positioned thereat;	
-wherein the rotating surface of the rotating body includes a second through hole formed therein, a punchable hole with X-shaped break lines formed therein, a small opening for receiving a small straw formed therein, and a closed surface having no hole selectively positionable into correspondence with the first through hole responsive to rotation of the rotating body.	The invention does not have a punchable hole with X-shaped break lines formed therein. This invention does not infringe this referencing prior art.

b. Is there is a possible (literal or DoE) infringement issue based on the above? If so, is there a design around option? If there is an infringement risk, and no design around option, please recommend further evaluation of the patent:

Literal infringement issue is not provoked because there are multiple flaws in the claims that result in non-infringement between the invention and the two references. The invention does not have a flexible plug with two support arms as the first reference does, and it does not have a second circular groove, a protruding knob, and a punchable hole with X-shaped break lines formed therein as the second reference does.

DoE infringement examination is then triggered. For the first reference of US8807371B2, the flexible plug and the two support arms share similar function with the swiveling fan-shaped cover piece in the invention. Nonetheless, the rotatable cover piece can be treated as an improvement of the flipped/rotated plug and the arms because it takes less space for storage, and costs less strength of the user for use. The second reference of US7721911B2 does not raise equivalent issue because it allows the user to select one hole from the four at a time of usage, while the users of the invention can have two holes open at the same time—users do not have to choose between them. In addition, the large hole in the invention offers enjoyment specifically for cheese foam, while the reference has four small holes but none of them is beneficial for cheese foam to come out. Thus, infringement issue is not drawn and design around option is not needed.

5. Section V – Summary

a. What next steps or risks can you identify? (Refer to Written Opinion Requirements for sample questions or issues):

Pursuing a patent application is possible based on the framework composed of novelty, patentability, and infringement issues, and according to the two references I examine. The novelty is obvious, useful, especially increases conveniency of users and cheese foam lovers, and the innovations are patentable subject matters. Since little to none infringement concern is drawn, modification is not required for this invention to file an application. The claims in the application should emphasize the design of the large hole with its purpose—allows cheese foam to come out more easily and can also serve as the hole that hot steam comes out, its conveniency—mitigates needed strength for plugging and unplugging, its portability—saves space for carrying without portions laying externally of the lid, and its longevity—possibly lasts longer than the first reference because the connection is not vulnerable and is combined to the lid with a fair amount of physical area. With these claims, the patentability review should pass.

The marketplace is very competitive. Take the U.S. as the example of country to apply for patent, many milk tea stores or bubble tea stores exist all around the U.S. There are at least 12 brands of bubble tea shops in Ann Arbor, each has their cup bodies and cup lids that best fit their products as far as they are acknowledged. Getting a patent may be beneficial since many stores sell cheese foam as a topping, and this design exclusively helps consumers enjoy cheese foam. In addition, the competitive market is a signal that encourages the inventor(s) to file an application.

One draw-back I can think of is that the growing environmental justice awareness may be a risk that results in policy banning the use of disposable plastic cup bodies and cup lids. However, simply changing the material of manufacturing an invention is typically not patentable, or the inventor(s) can improve their invention with materials that come with lower risks before they file their application.

There seems to be no other risks of infringement because the large hole is distinctive that keeps this invention from infringing other patented articles.

No other IP protection is recommended according to this invention since the inventor(s) or the assignee is unknown, and I did not feature the strength of the material used in this invention, which trade secret seems less a target pursuing.