Flying Footwear

Abstract

Our flying shoes are the new breakthrough that everybody's going to want. Shoes humbly began as coverings to keep feet warm and safe, and now are taken for granted as something we put on every day. In the future, shoes will be used as frequently as cars to travel long distances. How? By making them fly. We envision shoes with rechargeable, lightweight thrusters that will propel their wearer through the air. These shoes could be used for both walking and flying, as they will be activated by a hard stomp on the heel. With updated technology, they could be manufactured and sold at a reasonable price. They will also be relatively easy to use, as the shoes' steering systems will be close to that of a snowboard. Flying shoes will be an affordable, eco-friendly, and fun form of transportation.

Flying Footwear

Present Technology

Shoes are a part of everyday life, as nearly all people have at least one pair. These pieces of technology allow us to walk over nearly any surface without damaging our feet. Shoes have come a long way from their humble beginnings to where they are now. We now have shoes for nearly any occasion or weather condition. They allow people to walk through scorching sand and freezing snow with no pain. Shoes lift the restrictions of what we can do physically and allow us go wherever we want. Current shoes are made of many materials and come in many different sizes. The materials range from leather to canvas to nylon and synthetic materials, depending on the use of the shoe. They also allow us to move faster than we could barefooted, as our feet would be injured by moving at high speeds over rough surfaces. Shoes also have their limitations. They can break down easily, as most of the materials are not high quality. These shoes do not enhance the wearer's speed, and with the availability of automobiles, people rarely walk to their destinations. The increase of automotive travel and decrease of walking on foot has led to a rapid escalation of pollution and a decline in general health.

History

Shoes have been around since ancient times in the form of sandals or boots. Footwear in this time period was used strictly to protect the wearer's feet and keep them warm. In the recent past, shoes have been upgraded to be more fashionable, comfortable, and also to help with sports. The evolution of the modern day sneaker began in 1836, when the vulcanized rubber was patented. This new technology served as the sole of early sneakers. In 1878, the word "sneak" was defined as "shoes with a canvas tops and rubber soles." After the name became publicized, a

multitude of sneaker companies began to open. Reebok was founded in 1895 near Bolton, in England. Converse was founded in 1902 in Boston, Massachusetts and produced its first world famous "All Star" sneaker in 1917. The Dassler brothers famously split apart in 1948 to form Puma and Adidas, two brands which are still prevalent today. In 1966, Vans was established in California, and in that same year, Converse added seven new colors to its "All Star" shoe. Lastly, Nike released its first Air Jordan shoe in 1985, launching an extremely successful product. Throughout their history, sneakers, and shoes in general have been closely linked to sports. The materials used to make sneakers and other types of footwear vary greatly with use of the shoe. The main goal of any material is to be durable, efficient, and attractive. Many materials meet these requirements and offer a vast selection of sneaker styles that appeal to a large variety of consumers. In the recent past, synthetic materials have been developed to make shoes more durable and diverse than ever. Sneakers have made great strides since 1836, and are continuing to improve constantly.

Future Technology

Twenty years from now, shoes will be similar to what they are today, but with one aspect that is completely new: the ability to fly. We intend to make flying shoes so people can effectively travel more quickly without polluting the environment. Shoes will have the same basic shape and feel, but with an extra thick, heat resistant sole containing lightweight, electric thrusters powerful enough to propel the wearer through the air at speeds up to twenty miles per hour. These thrusters will contain fuel and free floating ions.When electricity is introduced to the thrusters, the ions receive charge and are expelled from the thrusters, generating thrust.The shoes will have a heat protective layer between the bottom of the interior of the shoe and the thrusters,

so the person wearing them experiences no discomfort. Also included are powerful lithium ion batteries inside that give electricity to the thrusters. These batteries will be rechargeable by plugging the shoe into an outlet, as the shoe will have a USB charging port and will come with a charging cord. The shoes will have multicolor LED lighting strips on either side which communicate the shoes' battery level, and when they need to be recharged. From 75% to 100% charged, the lights will be green. From 25% to 74% battery life, the lights will be yellow, and when the battery level drops below 25%, the lights will turn red. When the battery is in the "red level," it is imperative to get the shoes recharged. The shoes will always have the same battery life because they are charged at the same time and taxed evenly while flying. The shoes will have a power button on the outside of the right shoe, and they will be linked wirelessly to start at the same time. Once the shoes are turned on, the wearer needs to stomp once on the heel to activate the thrusters. The shoes will lift up their owner three feet off the ground and turn them 180 degrees so that their dominant foot faces forward. (The wearer's height, weight, dominant foot, and maximum speed level will be programmed when they purchase the shoes) To accelerate, the wearer must lean on one of their feet. If they lean on their back (non-dominant) foot, then they will go up, and if they lean on their front (dominant) foot, then they will go down. To stop and slow down, they must swivel themselves to a regular, forward facing position. Flying shoes will be a revolutionary technology of the future that can be used by nearly anyone as long as they put in the time to learn how to use them correctly.

Breakthroughs

There have been multiple breakthroughs during the process of creating flying shoes, and more are being made today. One breakthrough was finally getting the shoes to fly. This was the

first and hardest breakthrough. It was the most difficult because many factors came into play. Things like weight distribution, height, shoe size, energy and obviously gravity were important to consider when attempting to get the shoes to fly. Simple, yet sophisticated electric ionic thrusters were developed after a period of research. After this, things started to come together. There were still some problems though. One of them was battery life. There had to be a way to fit the battery into the shoe, yet make it last long enough to be efficiently used. After many ideas were put to test, there was eventually a decision on what form of battery would charge the shoe. Another problem was making sure the electronic shoe would not burn the user's feet. A heat protective layer of fiber reinforced plastic was added between the foot and electronic thrusters to ensure that there would be no problem with burning anyone. This material is composed of glass and carbon fibers coated with adhesives which are fire resistant. Certain chemicals have been added to this new form of plastic to improve flexibility for its use as the sole of a shoe. We are able to mold this material by using a technique called compression molding which applies heat and pressure to form the plastic into its desired shape. Another breakthrough was finding the right material that is compatible with the shoe, but also able to withstand any weather condition. This was one of the easier complications to overcome, as there are many materials with the ability to do that. The best material for the main body of the shoe was PU, a synthetic material that is very versatile and can be used to create thousands of different surface styles. PU opens up a world of creativity in new shoe designs, and will be a launchpoint for more styles of shoes. Although not easy, with hard work and dedication all of the obstacles present in creating flying shoes could be overcome.

Design Process

Many ideas had to be brainstormed and decided upon during the process of creating these shoes. One idea that was originally proposed was using solar power over electricity. At the conclusion of the process, using electricity was decided to be a better option than the alternative power source. Solar power could have many more consequences than an electric source. Although the shoes could continuously charge while flying on a sunny day, they would not charge on cloudy days. Another issue is that solar power is not as efficient as electricity. Electricity has its problems, though, as it could run out of charge faster and not have an unlimited supply like solar powered shoes. This is because the sun is always there on fair weather days and the user may not have an electricity source right where the shoe is being used. The size of the panels could be a problem too, as larger panels are needed to attract the amount of energy needed to power the shoe. A central thruster was also proposed to be the main power source to controlling the shoe. This thruster could control how sensitive the shoe's handling is. This sensitivity could make handling the shoe very challenging because this thruster would only be the size of the heel. The idea of multiple thrusters throughout the base of the shoe could provide more control and make it more stable, as the user can balance easier than just having one thruster. The last proposal was a battery level system. The original idea was to have a battery display at the heel of the shoe. The problem with that is that it is impossible to see your battery charge while you are flying and it would be necessary to take the shoe off to see how much charge is left in the shoe. The better option idea, which was eventually decided upon, was to have LED lighting strips around the shoe that display green, yellow, and red to let the user know how much charge they have left in the shoe. This system allows the wearer to see what the shoes

estimated battery level is at a glance while they are flying. These improvements were made to make a better overall shoe.

Consequences

There was extreme effort put into the making of these shoes. There was plenty room for error, although every effort has been made to make our flying footwear a failsafe technology. The flying shoes were made to be safe, comfortable, and efficient. Although these shoes are relatively safe to use, there are some precautions to know and there are consequences for not using the shoes properly. Although not extremely difficult, some users do find it hard to obtain their balance when first using the flying shoes. It is important to read the instructions carefully and thoroughly *before* putting the shoes on. This insures that the user knows how to correctly control themselves while in the air. It must also be made sure that the user takes it slow at first, which is listed in the instructions. If the user is unconfident, they may want to first try using flying shoes in an open, unobstructed area to ensure total safety. Another factor to be aware of is the battery life of the shoes. The flying shoes are made to have a long lasting battery life while in use. There are even indications shown on the shoes so that the battery life is known while flying. Even with these signals, it is possible for an individual to not realize how close the shoe is to running out of battery. This could cause severe injury depending on how high up they are. To guarantee one's well-being, it is vital to be aware and pay attention to how long the shoes have left in the air. Another thing to keep in mind is price. Like all other shoes, the original size of the shoe does not change. If the user's feet grow, another pair will have to be bought. This could be a little high on price, but not unreasonable. Despite these factors, flying shoes are an amazing investment and can bring so much ease and joy into a person's life. If a person has trouble walking, flying shoes

can provide a fun way to get around. Some people unfortunately have never had the opportunity to walk. Flying shoes give these people a chance to travel just as fast as anyone else. They enable people to get places quicker without wasting much energy, and are also great for the environment. The shoes are eco-friendly and do not give off nearly as much pollution as a car. Furthermore, shoes will have to be bought less often because there will be less wear and tear on them. If they are in the air, they cannot get as dirty or torn up as they would on the ground. Another great factor is that the shoes give the ability to do things more easily. It is no longer necessary to get ladders for objects that are hard to reach. All that needs to be done is slip on the shoes. Overall, the flying shoes are astounding invention and a great investment.

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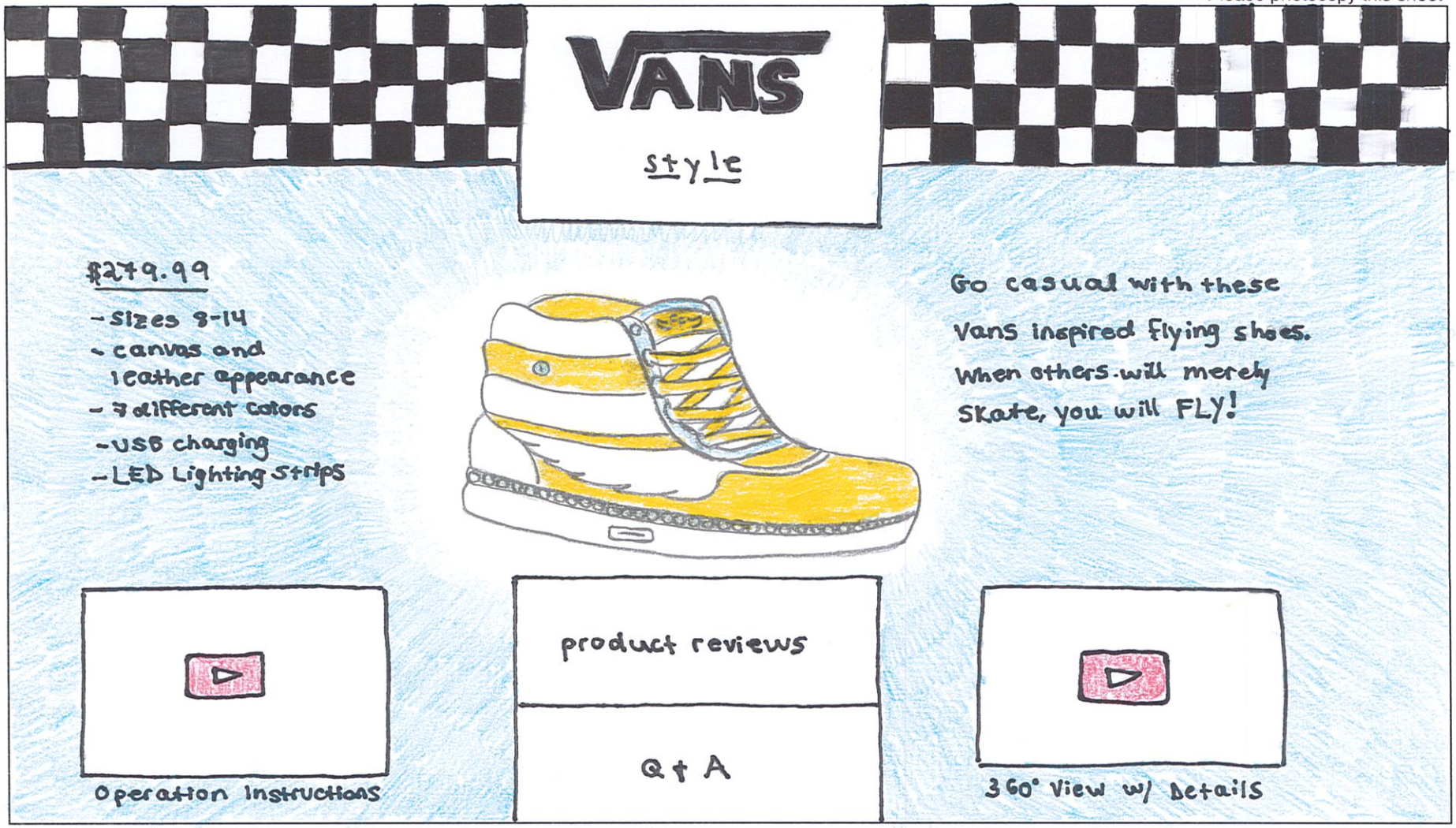

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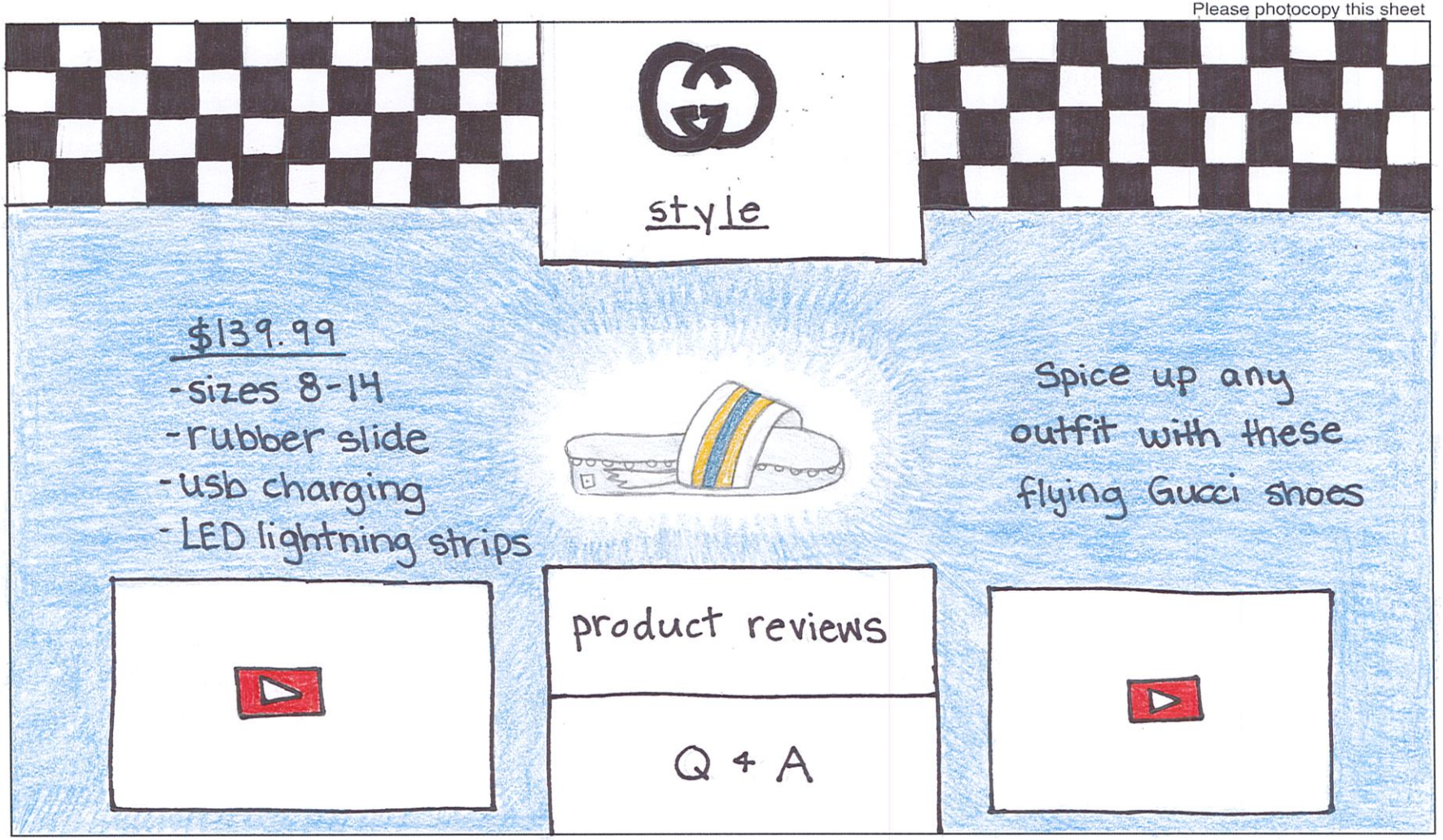

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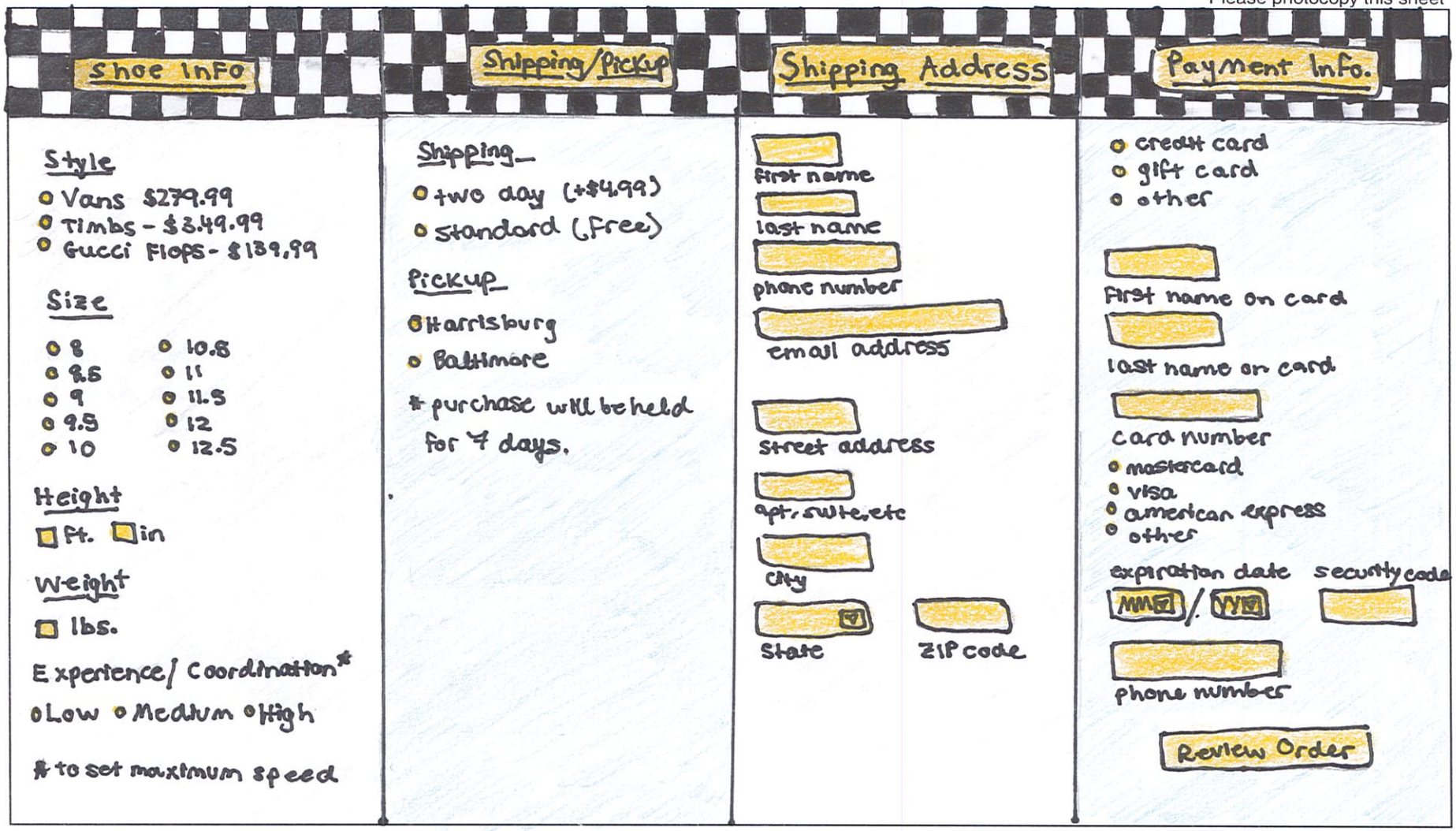

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